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THE GATEWAY TO THE POLYNIA.

A VOYAGE TO SPITZBERGEN.

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CONTENTS.

PAGE

INTRODUCTORY CHAPTER 1

CHAPTER I.

Old Whaling Captains—Our Schooner—Sealers—Ice Dangers—Our Crew—Ralph the Rover—The Shetlands—Scalloway Castle—Lerwick—Hard Times—Hialtlandia—Over-Greediness—Fin Whales—Right Whales—Whales' Food—Adventures with Whales 53

CHAPTER II.

Troubles in the Ice—Sea Birds—Wanderings on Shore—Objects of the Sea-shore—Extinct Craters—Fox Hunting—Aspect of the Icy Sea—First Experiences—In the Ice—Seal Shooting—Shoals of Seals—Seals and their Habits—Collecting Seal Oil—A Long Jump—Fog Gathering—Dodges to get within Range—Disappointment—Seal Battue—Danger Averted . 87

CHAPTER III.

Peterhead Steamers—Fleet of Sealers—Narwhal—We "Lie on Bran"—A Fall! A Fall!—Monodon Monoceros—Arctic Black Hole of Calcutta—Drifting Ice—Pursuit of Narwhal—A Sad Picture—Seals out of Water 127

CHAPTER IV.

PAGE

Only a Fly—Summer Beverages—Whale Adventure—Death of the Whale—Flencing the Whale—Wasted Ice—The Dreamer—Cunning of the Bear—Enthusiastic Nimrods—Dead Whale—The Farmer—Bear Outwitted—Awkward Complication—Deep Sea Soundings 151

CHAPTER V.

Miller-Casella Thermometer—Southerly Drift of Ice—Various Observations—Temperature Table—Diary Extracts—Star-Fish—End of Observations 180

CHAPTER VI.

Spitzbergen—The Gateway to the Polynia—Moffen Island—Walrus—Sea Devils—Moffen Island—New Dangers—Formation of Ice Floes 194

CHAPTER VII.

Difficulties in Narrow Waters—The Wounded Sea Bird—Nature most Desolate—Deer Stalking—The Drive 211

CHAPTER VIII.

Russian Memorials—Long Years of Waiting—Landing in Pursuit of Game—White Whale—Netting Large Game 223

CHAPTER IX.

A Short Cut—A Dangerous Descent—A Signal not Understood—Reindeer—Game less Abundant—A Day's Outing—On the Mountain Side—A Scramble—A Push and a Pinch—A Love Letter 234

CHAPTER X.

PAGE

Foreign Sailors—Old Stagers—The Snow Goose—A Remote Guano Bed—Geological Rambles 255

CHAPTER XI.

Barentsz's Voyage—Nova Zembla—Russians and Hollanders—Linschoten—Gerard le Ver—The Waigatz—Adventure with a Bear—Barentsz and Rijp—Beeren Island—Commencement of Winter—Sun Disappears—Effects of Refraction—Scientific Observations—Death of Barentsz—Barentsz's Relics . . 266

CHAPTER XII.

Professor Nordenskiold—Boats for the Journey—Method of Travelling—Parry's Journal—Latitude 81° 31′ 41″ N.—Meteorological Observations—Stout-built Boats—Thickness of the Ice—Formation of Ice—Long Time getting to 83°—If they had a Steamer—New Appliances—Dogs not Approved of—Shall we go North ?—Our Schooner—Whitby Lights—Old Customs Preserved—Scientific Inquiry in the North—Spitzbergen Route—Navigation comparatively Easy—Smith Sound Advocates—The Lydiana—New Land Reconnoitred—Iceberg System 301

APPENDIX 351

LIST OF ILLUSTRATIONS.

PAGE.

RED BEACH, SPITZBERGEN . . . . . *Frontispiece.*
BARENTSZ RELICS 11
WHALE 64
RUINS OF SCALLOWAY CASTLE 68
SHARK 79
WHALES' FOOD 82
BOTTLE-NOSE WHALE 85
SEA-BIRD 91
BRENT GEESE, EIDER DUCKS, AND YOUNG SNOW GOOSE . . 95
YACHT IN AN ICE FIELD 104
TREACHEROUS ICE 108
NARWHAL 136
BEAR AND SEAL 167
STAR-FISH 191
WALRUS 201
SKELETON OF A WHALE 205
WHALERS 210
ICE IN SMITH SOUND . . . . . *ib.*
REINDEER 223
LAKE, WITH REINDEER 229
WHITE WHALE 231
REINDEER SEEN IN PASS 232
A SHORT CUT 235
MOUNTAIN RAVINE 236
DANGEROUS DESCENT 237
ON THE MOUNTAIN SIDE 247
A PUSH AND A PINCH 251
VIEW FROM THE PEAK BETWEEN ICY FIORD AND WIDDIE BAY 252
SKETCH IN RED BAY 256
KING'S BAY 259
PARTING WITH NORDENSKIOLD 326
PRINCE CHARLES'S FORELAND 331
WATERSPOUT 350
SOME OF THE FOSSIL LEAVES WE FOUND IN SPITZBERGEN . 352

POLYNIA
NORTH AMERICA
ARCTIC OCEAN
BEHRING SEA
OKHOTSK SEA
ASIA
HUDSON BAY
LABRADOR
BAFFIN BAY
DAVIS STRAIT
GREENLAND
GREENLAND SEA
ICELAND
ATLANTIC OCEAN
NOVAYA ZEMLYA
SPITZBERGEN
NORWAY
SWEDEN
Lapland
Finland
RUSSIA
EUROPE
North Sea
North Pole

THE

GATE-WAY TO THE POLYNIA:

BEING

A VOYAGE TO SPITZBERGEN.

INTRODUCTORY CHAPTER.

"Ponti profundus clausa recessibus.
Strepens procellis, rupibus obsita,
Quam grata defesso virentem
Sinum nebulosa pandis."

THE British Sailor has taken a leading part in the exploration of the North Polar Regions since the Venetian merchant of Bristol, John Cabot, led the way under the patronage of Henry VII., at the close of the fifteenth century. The names of Willoughby, Frobisher, Davis, Hudson, Baffin, Ross, Parry, Franklin, Scoresby, Beechy, Back, and many others belonging to individuals who are yet alive, recall to our minds the deeds of our countrymen—deeds which shed a lustre upon the annals of the British Navy. At one time the motive for such enterprise was based upon commercial considerations, the desire being to

find a northerly passage to the wealth-producing East Indies. At another time, the efforts of our men were urged on by the hope of relieving, or of ascertaining the fate of, Sir John Franklin and his crew. It is now well established that there is not the slightest chance of finding any commercial route in high north latitudes which is likely to supersede those at present in use; and we have learnt all, or nearly all, that it is possible to do respecting Sir John Franklin and his crew. For many years past the English Government has relaxed its efforts, and the lead is being taken by other nations, such as the Germans, Swedes, Norwegians, Russians, and Americans. We want a new motive to rouse up the spirit of the nation and Government; and what higher and nobler one can be found than the search for truth and the advancement of science? This is the duty of a government, to promote the national welfare, and one of the surest ways in which this can be done is by encouraging scientific efforts. Millions are spent every year upon the navy and army, the main result of which is a large establishment and the performance of routine duty. It would cost little, if anything more, to give a large proportion of the men work to do, which would develop their intellectual and moral faculties, and thereby render them not only more useful in peace, but also more

effective in war. Captain Sherard Osborn has repeatedly dwelt upon this in his many spirit-stirring addresses advocating a renewal of Polar Exploration. In one of these addresses, read by him before the Royal Geographical Society on January 23, 1865, he says: "The Navy needs some action to wake it up from the sloth of routine, and save it from the canker of prolonged peace. . . . You are not going to educate us, work us up to the point of nautical perfection, awaken hopes and ambition, and then give us oakum to pick; or run us over the mast-head after top-gallant yards, to keep down the spirit which intellectual progress has evoked. The Navy of England cries not for mere war to gratify its desire for honourable employment or fame. There are other achievements, it knows well, as glorious as victorious battles: and a wise ruler and a wise people will, I hold, be careful to satisfy a craving which is the life-blood of a profession—indeed, I hold that it ought to be fostered and encouraged." There are few ways in which this spirit can be better fostered than by Polar Exploration, and so popular is such service amongst our sailors, more especially Arctic sailors, that hundreds of them volunteer to go when any project of this kind is afloat. From this point of view, the exploration of the higher latitudes is a matter for government, and not for private enterprise.

From the scientific point of view, it is a matter which requires both government and private enterprise. Many people, however, ask what is the use of such explorations? Who cares, say they, for a lot of barren ice-clad lands or frozen seas? and why should you encourage men to risk their lives for such objects as these? These questions chiefly emanate from those who do not see the advantage of prosecuting anything which does not promise a handsome pecuniary profit; who over-estimate the risks incidental to Arctic adventure, and who cannot appreciate successes which are simply scientific. Arctic voyages have yielded good fruit in the past, and there is every prospect of greater gains accruing to science from the explorations of the future. The present phase of Arctic Exploration, the characteristic feature of which is the attempt to reach the Pole, combined more or less with a spirit of scientific inquiry, promises to be a more glorious one than either of the two preceding phases; and since the English Navy has taken a leading share in these, it is to be hoped it will take a foremost one in the present phase.

In this introductory chapter the object will be to give, first, a rapid sketch of Arctic voyages; next, to show in a very summary way some of the results due to, and probable advantages to be derived

from, Arctic research; and lastly, to make a few remarks on the routes by which the Polar area is accessible.

The Phœnician mariners were probably the first recorded persons to enter the Arctic circle, the Ultima Thule of the ancients being apparently Iceland. The Irish may have again visited it in the sixth century. It was again discovered by a Norwegian named Naddodr in 860, and shortly after colonized by Norsemen. In 890 Ohthor made a voyage round the northern part of Norway, and along a portion of the north coast of Russia. Soon after this an Icelandic fisherman, Gembiorn, got caught in a gale which drove him a long way to the west. The first land he sighted was Cape Farewell, or, as he called it, Hoidsaerk (white shirt), from its being clad in white snow. The land was called Gembiorn's Land. In or about 982 Erek the Red was banished from Iceland, upon which he resolved to explore Gembiorn's Land. He soon reached the east coast of Greenland, which he followed in a southerly direction, and doubled Cape Farewell. The west coast was then explored for about a day's journey beyond, or as far as Hvarf, which is probably the modern Cape Egede. He returned to Iceland, and induced many of his countrymen to colonize the west coast of Greenland. These colonists

chiefly maintained themselves by hunting for whales, seals, &c., and by fishing; and in their pursuit of these occupations they frequented some hunting stations far to the north, one of which was called Northern Sæta. Their Bjarney, or Bear Island, is identified by Rofu with Disco Island. The region beyond Northern Sæta they called Furthern Stranda, of which Baffin's Bay was a part. How far north they advanced it is difficult to say, but a Runic inscription found on the island of Kingitorsoak, and bearing date 1135, shows that they had then reached at least as high as 12° 55′ N. These colonies flourished for a while, but owing to diseases, wars, and other misfortunes, they gradually declined and became extinct by about the beginning of the fifteenth century. In 1474 Columbus visited Iceland, and even sailed one hundred leagues beyond it; and it is not improbable he may have heard from the Icelanders traditions of their former occupation of Greenland and portions of the American continent. John Cabot, a native of Venice, but established as a merchant at Bristol, may also have heard of the western lands from the same source, since it is well known the Bristol merchant traded both with Norway and with Iceland. In 1497 John Cabot and his son Sebastian discovered Newfoundland. In 1498 Sebastian commanded a small fleet destined for Newfoundland, and

discovered Labrador, as also the great abundance of cod-fish along this coast. He also entered some strait, which some have thought was Hudson's Strait, but which was in all probability the Strait of Belle Isle at the mouth of the St. Lawrence. In 1500 a Portuguese, Gasper Cortoreale, fitted out some ships at his own expense, and coasted all along Labrador, as far as 60°, where he saw a river or strait blocked with ice, which he named Rio Nevado, but which is doubtless Hudson's Strait. These voyages had the effect of developing the Newfoundland cod-fishery, which was already well established in 1504. In 1517 Sebastian Cabot entered Hudson's Strait. After this there was a pause in the progress of Arctic discovery, although Master Robert Thorne made a bold proposition for an expedition to be sent across the Polar area to the Moluccas, and two ships were sent, but nothing of importance was done. In 1553 Sir Hugh Willoughby and Richard Chancelor were sent out under the instructions of Sebastian Cabot, to proceed to China by a north-east route. Willoughby commanded the *Bona Esperanza*, Chancelor the *Edward Bonaventure*, and Durfoorth the *Bona Confidentia*. When off the Norwegian coast the ships got separated by a storm, Willoughby proceeded as far as Willoughby's Land, which is probably a portion of Nova Zembla, and

wintered on the Russian coast near the Dwina; but the whole company were killed by frost and starvation. This disastrous result would have been prevented had the men been experienced in Arctic travelling, for they could have laid in a sufficient stock of turf and dwarf shrubs for fuel; and could have secured plenty of food, since some of the papers that have been recovered state that while the sailors were searching in all directions for natives to help them, they saw many bears, deer, foxes, and other animals, while those in the ship saw seals and whales in abundance. Chancelor proceeded to St. Nichola in the White Sea, and returned home through Russia by way of Moscow. His success led to the establishment of the Muscovy or Russia Company, by which many of the subsequent expeditions in search of the North-East and North-West Passages were organized and supported. In 1556 they sent Stephen Burrough out in the *Serchthrift*, and Sebastian Cabot, then eighty-eight years of age, saw the vessel off, and bade the expedition "God cheer." Burrough passed the island of Kolguev on July 14th, and next day he reached the coast of the mouth of the Petchora. He saw the St. James's Islands, and on July 31st he anchored amongst the Waigats Islands. He was the first navigator to sail into the Sea of Kara by the Karagate. In 1576 the project of the North-

West Passage was renewed by Sir Martin Frobisher, after having been neglected for nearly eighty years. Frobisher had been agitating his plans for fifteen years, and at last obtained support from the Earl of Warwick, and from Michael Lok, a man of wealth. Hence he christened Greenland, West England. On July 28 he saw Queen Elizabeth's Foreland, and went fifty leagues up Frobisher's Bay, which he considered to be a strait, and which he flattered himself would lead him to Cathay. He took home a piece of iron pyrites under the impression that it was an ore rich in gold. His second voyage was simply occupied in procuring three ship-loads of this ore, which was found to be worthless. On the third voyage (in 1578) he took out fifteen ships to be laden with this ore. When off the Queen Elizabeth's Foreland a storm blew him towards the straits, which he called Frobisher's Mistaken Straits, but which are commonly known as Hudson's Straits. He entered them, and found a fine open passage, through which, it is said, he "would and could have gone through to the South Sea." There was plenty of ice at the entrance, but farther in the sea was free from ice. However, his duty was to get the ore, and it was only when he found he had mistaken his way that he returned by a cross channel into Frobisher's Bay. In 1585 the London merchants again

subscribed for another north-west voyage, and in this and the following two years, John Davis commanded three successive expeditions. He sighted Greenland, and visited Gilbert's Sound in 64° 30′ N. From this he proceeded, on August 6, for five days, towards the north-west, and sighted land again in 66° 40′, at an anchorage free from ice. He named various prominent features here, such as Mount Raleigh and Cape Walsingham. This was the highest latitude then reached on the American side of Davis' Strait. He coasted this land to the south, passed the Cape of God's Mercy, sailed up Northumberland Inlet, and worked his way south into Frobisher's Strait, and then into Hudson's Strait. In his second voyage Davis simply explored the coast of Labrador. In his third voyage he went as far north, along the west coast of Greenland, as Cape Hope Sanderson, in 72° 15′, or well into Baffin's Bay; he seems to have reached the North Water, and hence to have been the pioneer to this well-known whaling ground.

The account of Barentsz's voyages is given in the body of our work, and here we may allude only to the discovery which was made this year of the house in which these hardy men lived during the long winter; the relics brought home are now deposited in the National Museum of Holland. The

various articles found are figured in the sketch appended.

Captain Waymouth's expedition, sent out in 1602 by the Muscovy Company in search of the North-West Passage, traversed ground which had been previously explored; and the expeditions of Cunningham and Hall in 1605, and of John Knight in 1607, were also without any result. In 1609, Henry Hudson, whose earlier voyages will be noticed presently, discovered Hudson's Bay; and in 1610 he was nominated to the command of the *Discovery*, with a view to renewing the attempt to find the North-West Passage. He went into Frobisher's Bay, which was

much obstructed with ice, then crossed the mouth of Hudson's Strait into Ungava Bay, and worked his way round the coast of the continent into James's Bay, where he wintered. On November 21 his crew mutinied, and he and a few others were turned adrift in a small boat. Nothing more was heard of them. In 1612, Sir Thomas Button, accompanied by Bylot and Prickett, explored portions of Southampton Island and Hudson's Bay, and wintered there without any material injury to the crew. In 1615, Bylot and Baffin passed Mill Island in Hudson's Strait, and traced the north-east coast of Southampton Island, from Sea-Horse Point to Cape Comfort. Baffin suggested that the North-West Passage should be sought off Davis' Strait, not through Hudson's Strait. Accordingly, in his next voyage, in 1616, also in company with Bylot, he passed Hope Sanderson on May 30, and was stopped by the ice in Horn Sound, 74° N. When the ice permitted, he kept on north, passing by Cape Dudley Digges in 76° 35′ N., Walstenholme Sound, Whale Sound in 77° 30′ N., and Hakluyt's Island. He proceeded a little north of this, and saw a large sound stretching away north, which he named Smith's Sound. He then turned south, following the west side of Baffin's Bay. He saw Cary Islands, Jones's Sound, and Lancaster Sound, which was blocked up by ice (July 12).

Through stress of weather, together with the ill-health of his crew, he was unable to ascend these sounds, and was compelled to make for the coast of Greenland. His report of the great abundance of whale in Davis' Strait led to the whale fishery there. Meuck's voyage to Hudson's Bay in 1619 calls for no remark; and that of Captain Luke Fox, in 1631, was chiefly a re-survey of what Button had seen. Fox, however, coasted along the east side of Cumberland Strait, as far as St. Peregrine, in 66° 47′ N. In the same year Captain James wintered in James's Bay, and discovered Charlton Island. After this period most of the north-west expeditions were at the expense, not of the Muscovy Company, but of the Hudson's Bay Company; but none of these advanced beyond previous explorers until we come to Captain Middleton, who, in 1741, discovered Wager River, entered Repulse Bay, and saw the Frozen Strait off Southampton Island.

The voyage of Moor and Smith, in 1746, did not lead to the discovery of the North-West Passage, nor to any discoveries within the Arctic circle, but both their ships went up Chesterfield Inlet. Hearne's land journeys added much to our geographical knowledge of North America; but in this place they are noticeable, because he advanced to the mouth of the Coppermine River, in 67° 48′ N.; since this fact showed that the

North-West Passage must be within the Arctic circle. This was also shown by Cook, in 1776, when he coasted along the west coast of America, through Behring's Strait, as far as Ice Cape, in 70° N. In 1789, Sir N. Mackenzie followed the Mackenzie River to its termination in the Arctic Sea. He determined the latitude of Whale Island, off the mouth of the river, to be 69° 15′ N. In 1818, Captain John Ross and Lieutenant W. E. Parry went up Davis' Strait, but they did little more than confirm the observations of Baffin. Lancaster Sound was, however, now found to be free from ice, and Captain Ross sailed into it a short way. He was induced to return by the sight of the Croker Mountains, which subsequent research proved to be purely visionary. His own men doubted the accuracy of his sight, and accordingly Parry was sent in 1819 to explore Lancaster Sound. His ships, the *Hecla* and *Griper*, passed over the supposed site of the Croker Mountains, through Barrow's Strait and Parry's Sound, to the south side of Melville's Island, where he wintered in Winter Harbour. In the following year he attempted to advance through M'Clure's Sound, but did not succeed. His first voyage was undertaken in two small ships, the *Gabriel* and the *Michael*, and narratives of this and his subsequent voyages were written by Hall, Best, Settle, and Ellis. The first land sighted

was Cape Desolation, near the south end of Greenland. Here the *Michael* left Frobisher, who, notwithstanding his vessel had been much damaged by storms, determined to see whether he could not strike land by pursuing a north-west course. It should be remembered that at this time the discoveries of the Icelanders had been forgotten, and were hidden antiquarian lore not accessible. This was one of the most successful and ably-conducted Arctic voyages which had yet been made. He discovered the islands of North Devon, Cornwallis, Bathurst, Melville, North Somerset, Cape Walker, and Banks's Land, which forms part of Baring's Island. From 1819 to 1822 Sir John Franklin made extensive journeys in the Hudson's Bay territories. He went to the mouth of the Coppermine River, and from thence took a boat and surveyed the coast as far east as Point Turnagain, in 68° 19′ N. In 1821 Sir W. E. Parry again went out, accompanied by Captain Lyon, and confirmed the discoveries of Middleton. He passed the first winter at Winter Island, and the second at Igloolik, and followed the Fury and Hecla Strait to its junction with Regent Inlet. In 1824 he again attempted to reach Regent Inlet, but without success. In 1825 a series of explorations were organised: Franklin, in this and following years, surveyed the coast from the Mackenzie River on the east to the

Return Reef on the west, or to within one hundred and sixty miles of Point Barrow. Captain Beechey sailed through Behring's Strait to Point Barrow, in 71° 38′ N. Dr. Richardson and Lieutenant Kendall coasted in boats from the mouth of the Mackenzie River eastward, doubling Cape Bathurst, in 70° 31′ N., and Cape Parry, in 70° 6′ N. They passed through the Dolphin and Union Strait, and thus reached the mouth of the Coppermine River. These discoveries rendered a North-West Passage almost certain, for, with the exception of one hundred and sixty miles, the north coast of America had been traced from Behring's Strait to Point Turnagain, in 109° 25′ W.; while Parry had advanced in a higher latitude to about 116° W. The discovery of a connecting north and south passage would complete the search. In 1829 Captain John Ross commanded an expedition sent out at the expense of Sir Felix Booth. He discovered Boothia Felix, explored portions of the Gulf of Boothia, and determined the site of the magnetic pole. His stay was an unusually prolonged one, his return to England not occurring till 1833. His brother, James Clark Ross, made extensive sledge journeys, in the course of which he traced portions of King William's Island, Boothia Felix, and North Somerset; but he crossed Brentford Bay without noticing Bellot's Strait,

which bounds the northernmost point of the continent in 72° N. Owing to the long absence of this expedition, Captain Back, supported by public subscription, was sent in search of it. He wintered in 1833 on Great Slave Lake, and in 1834 descended the Back River to its mouth, and explored the coast from Cape Britannia to Point Richardson, thus almost reaching the southern termination of James C. Ross's sledge journey. Back's voyage, in 1836, failed in accomplishing its object, but the work which it was proposed to do was in great part effected in the years 1837, 1838, and 1839, by Messrs. Dease and Simpson, who, in a series of boat-voyages, traced the coast from Point Barrow to the estuary of the Back River. They laid down portions of Wollaston Land, and of King William's Island. Thus, the only gap in the completion of the North-West Passage was a connection between Franklin's Channel and the Gulf of Boothia. Dr. Rae was selected to make this completion. He surveyed portions of the Gulf of Boothia, and found that the Boothia isthmus separated this gulf from the sea explored by Dease and Simpson. In 1845 Sir John Franklin was sent out in command of the *Erebus* and *Terror* to attempt the North-West Passage. In July the expedition reached Whale Fish Island, Baffin's Bay, from whence letters were despatched, and the last that was seen of it was

on July 26, when it was making for Lancaster Sound.

In 1858 Sir Leopold McClintock and his expedition found some documents, from which it appears that Franklin proceeded through Lancaster Sound, and up Wellington Channel, to the north of Bathurst and Grinnell Island; then they turned south, through Crosier Channels, Barrow's Strait, Peel's Sound, and Franklin Channel, thus completing the discovery of the long-sought-for North-West voyage. The crew must have explored or seen portions of North Somerset, Prince of Wales's Island, Boothia Felix, and King William's Island, on or near which most of the crew died in the spring of 1848. As no news could be gleaned, search parties were sent out, the first in 1847, and McClintock's, which was the fortieth, in 1857. Here, however, we can only notice those which proceeded over new ground.

In 1849 Sir J. C. Ross traversed Peel Sound, and examined the coast of North Somerset as far south as 72° 38′ N. Parry surveyed Wellington Channel as far as Cape Beecher. Captain Austin examined portions of Bathurst's Island and Byam Martin's Island, as also portions of Prince of Wales's Island and Russell's Island. This latter work was chiefly done by Captain Sherard Osborn, who was then a lieutenant. Captain

Austin also entered Jones Sound. In 1850 Captain M'Clure proceeded through Behring's Strait, doubled Point Barrow, and continued into the south end of Banks's Land or Baring's Island. He then passed through Prince of Wales's Strait, and got stopped by the ice in Parry's Sound. He wintered in the strait, and explored portions of the northern part of Wollaston Land, which he named Prince Albert Land. Parties sent out by him travelled round most of the island, the only part of the coast not explored being about one hundred and sixty miles along McClintock's Channel. In 1851 the attempt to cross Parry's Sound was renewed, but without success. A more northern route was tried, but he was compelled to take shelter in the Bay of Mercy, on the north side of Baring's Island. The ship was ice-bound during the next two winters, being relieved by Captain Kellett, of the *Resolute*. The ship was abandoned, but Captain M'Clure and his crew were transferred to the *North Star*, which took them to England through Baffin's Bay, and they were consequently the first persons who had traversed the North-West Passage from end to end. Mr. Kennedy and Lieutenant Bellot discovered Bellot's Strait in 1852. In this year, also, Sir Edward Belcher went up Wellington Channel to Northumberland Sound in 76° 52′ ; he also surveyed the south side of North

Cornwall, Belcher Channel, and portions of North Devon. M'Clintock examined Prince Patrick Island, while Commanders Richards, Sherard Osborn, and others, explored the northern shores of Melville, Bathurst, and Cornwallis Islands. In 1851 and 1852 Captain Collinson sailed through Behring's Strait, through Dolphin and Union Strait, to Victoria Land, and proceeded in sledge to Gateshead Island, thus overlapping the furthest point reached by Sir John Franklin. In 1851 Dr. Rae made a more minute examination of Boothia Felix, fully established the fact that King William's Island was an island, and found numerous relics belonging to Sir John Franklin's crews at the same time that he collected the reports of the natives as to their fate, and fairly earned the Government reward of £10,000.

Independently of the geographical results which were achieved by Dr. Rae's journeys, an especial value attaches to them on other accounts. They stand out prominently in the annals of Arctic voyages as having been carried out at less comparative expense than almost any other, and yet as efficiently as any. They are good examples, out of several journeys which might be instanced, illustrative of the fact that Arctic voyages have been and can be successfully conducted by private individuals and private funds as well as

by Government officers, backed by the Government treasury. Dr. Rae was connected with the Hudson's Bay Company, and with less than a dozen *voyageurs* on each trip he made the following journeys on foot :—

		Miles.
1844-5.	Red River Colony to St. Mary's .	1180
1847.	From Repulse Bay round Committee Bay	1200
1851.	From Bear Lake and on Arctic coast .	1080
1851-2.	Attrabosca to St. Paul's, assisted by dogs for 450 miles . . .	1730
1854.	From Repulse Bay to Castor and Pollux River.	1100
		6290

Of this, 1765 miles was through territory and along coasts which had not been previously explored.

In 1853 Dr. Kane went in the *Advance* up Smith's Sound, and succeeded in getting his ship into Rensselaer Bay, 78° 35′ N., where he wintered. This is the highest latitude that any ship had wintered in. Expeditions were made on foot and in sledges, almost as far as 81° N., or past the Humboldt Glacier, Peabody Bay, and into Kennedy Channel. The furthest point seen by Mr. Morton was

Mount Parry, believed to be in 82° 14′ N., which is the northernmost land yet discovered, and which, in the summer of 1854, was washed by an extensive open sea. In 1858 McClintock entered Pond Inlet. He explored portions of the coast line of North Somerset, proved the insularity of Prince of Wales's Island, and so traced the whole coast of King William's Island, where he heard of Sir John Franklin, and found both relics and documents appertaining to his party. Dr. Hayes, who had accompanied Dr. Kane, resumed the search up Smith's Sound in 1860. His ship reached Port Foulke, which is thirty miles south of Rensselaer Bay. He crossed to the west side of Smith's Sound, and followed the coast to 81° 35′, and beyond this he saw a bold headland, Cape Union, which he placed in 82° 30′ N. On May 17 there was very little ice to be seen in the ocean visible from the farthest point he reached. In 1867 Captain Wells, of the steam whaler *Arctic*, took his ship as far north as the Humboldt Glacier, that is beyond Kane's farthest by ship, and then, towards the end of June, there were no signs of ice to the north. In June, 1871, Captain Hall started for the north, in order to settle the question of this open sea, and to follow Grinnell Land to the Pole.

Having disposed of the discoveries north of the American continent, those made to the north of

Siberia, chiefly by ships passing through Behring's Strait, next call for attention. The Lena was discovered by Cossacks in 1630; and the Jana by Busa, in 1638, and in 1639 he proceeded east to the Tshendoma River. About this time, also, Ivanoio discovered the Indigirka, and followed the coast to the Alaseia, in 163° E. Staduchin coasted from the mouth of the Kolima to Cape Chelagskoi, which is in about 70° N. In 1648 Deschnew passed from Cape Chelagskoi to the Gulf of Anadyr. In 1710 Permäkow heard of the Liakhow Island off the Svätoi-Nos, and subsequently made an unsuccessful attempt to explore it. In 1770 Liakhow discovered the group of islands bearing his name, but their correct positions were first ascertained by Anjou in 1823. The largest islands are called Kotelnoi, New Siberia, and Fadejevkoi. The Herald Islands, in 71° 26′ N. and 175° 16′ W., were discovered by Capt. Kellett in 1849, but doubts were thrown on the facts. It is probably the land to which Wrangell had previously alluded as sometimes visible from Cape Yakan. In 1867 portions of this land were seen by several captains. Captain Bliven saw land north-west of Herald Island, extending as far north as 72° N. The coast has been distinctly traced for one hundred miles or more, and portions sighted, which would give it a length of more than five hun-

dred miles. It is believed to be inhabited. How far north it extends has not been ascertained. This, then, is the most northern land known in this region, and is almost as northerly as the Liakhow Islands.

The voyages in search of the North-East Passage and in the Spitzbergen Sea may now be resumed. The last we noticed was Burrough's. Pet did little more than follow in his footsteps, the principal novelty being the discovery of the southern passage of Vaigatz, known as the Strait of Nassau, in 1580. About this time some English vessel had crossed the Sea of Kara, and had thus gained the mouth of the Obi. Barentz, in 1594, coasted along the west side of Nova Zembla, from Langenes to the islands of Orange. In 1596 he and Rijp discovered Bear or Cherie Island, in 74° 30′ N., and soon after the Spitzbergen group of islands. They followed the south coast of North East Land, passed through the Hinlopen Strait, and doubled the north end of New Friesland and West Spitzbergen, in 80° N. In 1607 Henry Hudson attempted to sail straight across the Polar Sea. He struck the east coast of Greenland, in 67° 30′ N., and after proceeding north for seven or eight leagues he saw a headland, which he named Young's Cape. He continued on a N.N.E. course, and at his farthest point, which he considered to be 73° N., he saw land, which he called

Hold-with-Hope. Beyond this he continued for nearly a week in a general northerly bearing, and on June 27 again saw land, which he named Newland or Greenland; but which seems to have been Spitzbergen, near Vogelhoek, in 78° 53′ N. For the next fortnight he tacked about. In July he seems to have advanced as far north as the Seven Islands, but the ice prevented him from reaching a higher latitude. In 1766 Tchitschakoff went to Spitzbergen, and attempted to reach the Pole, but was stopped by ice at 80° 28′ N. Captains Phipps and Lutwidge, with Horatio Nelson among their crew, renewed the attempt in 1773. Ice only was visible from the summit of a mountain on one of the Seven Islands. They reached 80° 36′ N. in 2° E. and 80° 48′ N. in 20° E., and had failed in penetrating any part of the pack edge in the intervening region. On August 7 the ice at the edge of the pack was twenty-four feet thick. In 1776, Pagès is said to have reached 81° 30′ N. to the north of Spitzbergen. In 1806 Captain Scoresby reached as high as 81° 30′, and reported that the sea was open for many leagues to the E.N.E.; but as his object was whales, he made no attempt to see how far north this open water extended. Captain Brook surveyed the north coast of Spitzbergen in 1807. In 1818, Captains Buchan and John Franklin went north in two old whalers, and penetrated the

pack for thirty miles, the highest latitude reached being 80° 34′ N. In 1823, Sabine and Clavering went to Spitzbergen, and along the coast of Greenland, from the Bay of Gaal Hanke, which Scoresby had seen, to Pendulum Island and beyond, as far as 75° 12′ N., from which point land could be followed as far as about 76°. It was on Spitzbergen and Pendulum Island that Sir E. Sabine conducted his well-known pendulum experiments. In 1821 Admiral Lutke surveyed the coast of Nova Zembla as far as 75° 45′ N., and, in 1822, as far as Cape Nassau, in 76° 35′ N., but he could not double the Cape owing to the ice. In 1824 he examined the edge of the Polar pack, from Nova Zembla to 43° 49′ E., and found it to be continuous in about 76° N. In 1827 Sir E. Parry sailed in the *Hecla* past Hakluyt Headland, and as far as 81° 5′ N., without seeing any appearance of the pack to the north; the date being June 14. The ship was anchored in Hecla Cove, 79° 55′ N. A journey was then attempted in boats which were specially adapted to act also as sledges. The northern boundary of floating ice was reached in 81° 12′ 51″ N., on June 23. The travelling was exceedingly difficult, as the ice was very loose and rotten. On July 11 firmer ice was reached. On July 20 the ice was still floe ice, such as a steamer could get through. On July 23 the

highest latitude, 82° 45′ N., was attained, and then Parry was obliged to return, owing to the efforts of his men to proceed north being almost counterbalanced by the southerly drift of the ice. No land was seen to the north; the only indication of such was some mud in holes of the ice in 82° N. Parry succeeded in reaching the highest latitude that has yet been attained either by ship or by travelling over the ice. From 1835 to 1840 a scientific commission, under the direction of Gaimard, explored and drew up voluminous reports on Iceland, Greenland, and Spitzbergen. From 1858 onwards the Swedes have been making most extensive explorations in Spitzbergen and the surrounding seas. They have accumulated an immense store of valuable scientific information. They have made regular surveys of the Spitzbergen Islands. In 1864, Messrs. Nordenskiöld and Duner completed the survey for measuring an arc of meridian in high latitudes, as a means of ascertaining the true figure of the earth. In August, 1868, the sea off North Cape was almost entirely free from ice. The highest latitude reached in the ship was 81° 42′ N. in 17° 30′ E., which is higher than Parry's farthest or even Pagès'. No land was seen, but in several places the ice was black with stones, gravel, and earth. In October another effort was made to advance north in the *Sofia*.

In 80° 40′ N., sporadic blocks of drift ice were encountered, which increased in number and size the farther the ship went. The ice between the large ice masses was two or three inches thick. An accident happened to the *Sofia* in 81° N., which compelled her to return to an anchorage in King Bay in order to be repaired; but as she was too much damaged to do further work in the ice, the expedition returned home, reaching Tromsö on October 20. In 1869 Captain Koldewey proceeded to Shannon Island, and made numerous scientific observations there. The winter coming on, he was obliged to go into harbour, where he was frozen in on September 22. During the winter sledge journeys were made, and the highest latitude reached was 77° 1′ N., on April 15, 1870, when severe storms drove the party back. At this point the shore was lined by ice four miles wide, and apparently several years old. Extensive surveying and other scientific operations were carried on. A large fiord was discovered in 73° 13′, which was ascended for seventy-two miles. This expedition was a very successful one from a scientific point of view, and was important in showing that on the east coast of Greenland, in 75° N., reindeer, musk oxen, and other terrestrial animals occur in great abundance, while the climate seems to be mild. Another important voyage

was made in the autumn of 1870, under the guidance of Count von Zeil and Herr von Heuglin. They went to Stans Foreland, and navigated Stor Fiord, as far as Heelis Sound. In August they went through Thymen's Strait, and ascended Mount Middendorf, 1500 feet high, from whence they saw a large tract of land stretching away east, with a lofty range of mountains running north and south, and visible for about sixty miles. In 1871, Lieutenants Payer and Weyprecht attempted to follow up these discoveries by proceeding through Stor Fiord. The way was blocked, and so they tried to get to the east of the Spitzbergen Islands. Hope Island was found to be free from ice on August 19. On August 28 they reached 77° 17′ N., and further east the ice became lighter. On August 30 they were beyond 78° N. and 41° E. in a sea free from ice. In the night ice was struck drifting to the north. On September 1 they were in 78° 48′ North and about 42° E. Their further progress was stopped not by ice, but by fogs and contrary winds. Contiguous land was indicated by drift-wood, fresh mud, fresh-water ice, and eider ducks. The whole sea between this and Nova Zembla was free from ice. After this, heavy south-west gales drove the ship to 78° 5′ N. and 56° E. The homeward journey was made against a series of south-west storms,

and Tromsö was reached on October 4. In September, 1871, Captain Carlsen revisited Barent's House in Ice Haven, followed the east coast of Nova Zembla, and by passing through the Vaigatz Strait he circumnavigated that island. In 1871 Captain Mack sailed from Tromsö as far as 82° 30′ E. Captain Johannesen sailed about the Sea of Kara as late as October without seeing ice. Several other captains made voyages in the seas near Spitzbergen and Nova Zembla, during which they met with little or no ice from early in June to late in October. In 1872 another Swedish expedition was sent to Spitzbergen. According to the programme, it is proposed to explore the eastern Spitzbergen Sea, and to map the whole of the eastern lands; to make a continuous series of meteorological and magnetical observations; and to carry out researches on the pendulum, as also in botany, geology, zoology, and other natural sciences. It is also intended to make another attempt to reach the Pole by means of reindeer and sledges. In the summer of 1872 Captain Altmann found the sea east of Spitzbergen free from ice, and saw eight islands occupying the position assigned by Petermann to King Charles's Land. The south end of the westernmost island is in 78° 43′ N. and 28° 5′ E., and the most easterly is in 79° 3′ N. and 32° 17′ E. He sailed between the

islands until he reached the ice-fields to the east of the easternmost island; and, although the weather was clear, he could see no land to the north. This is not the Gillis Land of old geographers, which is probably identical with another group of islands about sixty miles farther north. In the summer of 1872, Captain Johnsen also cruised in this region. He sighted land in 78° 18′ 46″ N. and 30° E., which he reports as belonging to a large island forty-four miles long, the shore of which is covered with drift-wood. He sailed along the east and south shores of this land, which were free from ice; there was ice at the north end. In this year also the second cruise of the *Sampson* schooner yacht took place to the Spitzbergen Seas, of which an account is given in the present volume. Although it was an unusually close season, she reached 80° 30′ N., 12° E.; her further advance being checked by a leak caused by ice nips. She sailed from the Shetlands, May 29; left Widde Bay on her return, August 17, and reached Hull, September 26. In 1871 she reached 81° 15′ N.

The above sketch shows that except at a few points we know very little respecting the seas and lands situated to the north of about 75°. The degree of flattening in the polar region, and hence the true form of the earth can only be ascertained by the measure-

ment of arcs in all latitudes, or by numerous pendulum observations. This is a point, the settlement of which is of considerable importance in physical science. Very little is known respecting the meteorology of the polar region. This science is in its infancy, and yet it is abundantly manifest that the various phenomena of climate are regulated by definite laws, of which only glimpses are as yet perceptible, and that a knowledge of the circumpolar climate would be an essential aid to the meteorologists of more temperate climates towards ascertaining what those laws are. The peculiar condition of these regions with respect to solar heat and light opens up a field of investigation which has as yet scarcely been touched. Within the Arctic Circle, the longest day or period of constant light and heat varies from twenty-four hours at 66° 30′ N. to six months at the Pole. At the Pole the sun would be first seen above the horizon at the spring equinox, and would not again sink below it till the autumnal equinox. Early in the season its altitude would be very low, but as time went on its height would steadily increase until June 21, when the sun's declination would be 23° 28′. After this it would gradually sink. At a certain distance south of the North Pole the period of constant daylight would be five months, but the sun would attain a greater

maximum height in the sky. During the midsummer months the sun would acquire considerable heating power, and this power would be so constant, and free from diminution by nocturnal cooling, that the land and waters would become warmed, and would absorb heat. This heat would be gradually liberated later in the year. The local distribution of heat would be modified by the nature of the ground, the height of land, and the distribution of sea and land; but it is theoretically probable that at the Pole the mean temperature of the air in July and August is much higher than it is generally thought to be. During the winter the continuousness of the night would equally favour a very low temperature, so that probably the range of temperature in the circumpolar area is greater than in any other part of the globe. Evidences of high summer temperature are not entirely wanting. Many of the most northern coasts reached are strewed with drift-wood, and even trunks of trees, which in many cases appear to have come from the north. A list of the species thus occurring would throw light upon the probable localities where they grew. Again, streams or outflows of warm water from the Pole have been observed in many localities.

These, wherever met with, are commonly assigned to the Gulf Stream; but as will be noted in a subse-

quent chapter, the warm water originates at the Pole. This is a question which requires investigation. There are many other questions connected with Polar temperature of a very complicated and involved character, which cannot be fully entered into here. One or two may be alluded to. It is known that the mean temperature of the Southern hemisphere is lower than that of the North; and it is a matter of observation that the Antarctic Pole is more extensively ice-clad than the Arctic. This may be in part conjecturally explained by the greater extent of land at the South than at the North Pole. It is also known that the earth revolves round the sun in an elliptic orbit, so that it is at one time nearer the sun than at another. At the present time the Poles are farther from the sun in summer and winter than in spring and autumn. It has already been indicated that the North Pole is warmed up during the summer, and as the warming of the South Pole occurs under similar conditions as regards heat, &c., the South Pole should have a similar temperature whereas it is the coldest. This is probably indicative of the North Pole being for the most part surrounded by water. During the spring the heat is being gradually increased by the gradually increasing height of the sun, which increase is in part counterbalanced by the

recession of the earth from the sun, while in autumn the decline is in part counterbalanced by the earth approaching the sun. This would help to raise the autumn temperature. If the northern summer occurred when the earth was nearest the sun, the circumpolar area, it is believed, would be heated more strongly than it is now. The intensity of the heat might be still further increased by another modification of conditions. The present eccentricity of the earth's orbit is slight compared to what it has been in past times. At present the earth is 3,000,000 miles less than the mean distance nearer the sun in aphelion than in perihelion; but at certain periods it has been 14,500,000 miles less than the mean nearer the sun in aphelion than in perihelion. In other words the earth when nearest the sun is now about 88,400,000 miles from the sun; but during past epochs it has approached to within about 77,000,000 miles. The intensity of the heat is in inverse proportion to the square of the distance: so that if the Arctic Pole were exposed to this greater heat during summer, the temperature, other conditions remaining the same, would be proportionately increased. There is yet a third modifying cause which would tend to intensify the heat. The obliquity of the ecliptic is now 23° 28′; but astronomers

admit that it may have been at times as much as 30°. This would imply a more extensive Arctic circle, and a higher, therefore a hotter, sun during the mid-summer months. It is possible to conceive a time when the Polar regions were under the most favourable conditions as regards heat—a time when the earth was at its nearest to the sun in midsummer when the Polar region contained little or no land, and when the sun rose high in the heavens, shining for weeks or even months with noon-day power. At present the conditions are for the most part not the most favourable for warming the North Pole; and the fact that it is less ice-encumbered than the South Pole probably arises from there being, as is supposed, little land near it. The conjectures above given as to what may have been are rendered probabilities by the character of the fossil plants which have been discovered in high latitudes. On Bear Island has been found the earliest rich land flora as yet known. Its age is assigned to the beginning of the Carboniferous epoch, or the later portion of the Devonian epoch. This flora comprises species of *Calamites, Lepidodendron, Cyclostigma,* and many ferns. The individual specimens are exceedingly abundant. The flora has been traced from 47° to 76° N. A flora of a somewhat similar character occurred in Parry Island

and Spitzbergen at a somewhat later period, represented by the mountain limestone. Further research will probably indicate its occurrence in other northern countries. The bearing which these facts have on climate is thus expressed by Professor Heer: "Moreover the climate of Bear Island must have been as favourable to the growth of plants as that of Ireland or the Vosges, although that island lies 26½° farther north; for the corresponding species are as large and quite as luxuriantly developed, and have even produced more considerable coal strata than those of lower latitudes in the same period. Warmth, therefore, must at that time have been more equally distributed over the earth, whilst already in the Miocene time a great difference had begun to arise, which has increased immensely up to the present time. The climate must have been not only more equable but warmer, as is shown by the coral banks which were formed at that time in Spitzbergen, as well as by the enormous tree-like cryptogams, and the large-leaved ferns which Bear Island produced." In Greenland fossil plants belonging to several periods have been discovered. Those from Angiarsuit and Kassok are very old, but the age has not been determined. They however seem to be similar in character with those from the lower cretaceous beds at Korne. At

this place these beds represent terrestrial conditions, there being an entire absence of marine fossils. This flora is characterized by numerous ferns, especially Gleicheniæ; by a remarkable cycad (*Zamites archea*); by numerous conifers, belonging to the genera Pinus, Sequoia, &c.; and by the absence of dicotyledons. The upper cretaceous beds are developed between Atanekerdluk and Atane. They comprise thick strata of coal, and the fossils are terrestrial; the marine being absent. The flora comprise cycads, ferns in abundance, Sequoia, and numerous dicotyledonous leaves. The great bulk of the strata on and around Disco Island are of Miocene age. Plants have been collected from three distinct horizons representing periods separated by considerable intervals of time. The lowest horizon occurs at Atanekerdluk. The beds are remarkably rich in impressions of plants, and in carbonized trunks of trees. These trunks are in places so abundant that the Greenlanders collect them for fuel. The second horizon contains beds of coal, and impressions of leaves, cones, seeds, &c., as also carbonized and silicified tree-stems at Netluarsuk, Ifsorisok, and Assakak. At Sinnifik and at Perilosok an upper Miocene flora occurs, represented by fragments belonging to such trees as *Salix Platanus, Cratægus, Sequoia, Taxiles,* and *Populus.*

These localities are on or near 70° N. Spitzbergen also has yielded a rich Miocene flora.* These floras indicate a climate as warm as the temperate, or perhaps even the temperate parts of Europe at the present time. Professor Heer believes that extensive forests were spread over all the North Polar lands during the Miocene period. Dr. Hooker infers from the present remarkable distribution of the Arctic plants that they migrated across the Polar region at a time when the warmth was much greater than now. An examination of the plants of the Polar lands, discovered and undiscovered, present and past, would enable botanists to found their conclusions on a broader and safer basis than they can now. The work that has already been done * is a strong inducement to continue the research and render this region one of the most interesting and instructive in the world.

Another branch of science which would be greatly advanced by Polar research is terrestrial magnetism. The magnetic needle, as is well known, points to the magnetic North, or Pole, which Pole lies considerably to the south of the earth's Pole. In 1830 Sir James Ross discovered it in 70° 5′ 17″ N., and 96° 46′ 45″. It is also constantly shifting its position from E. to W. and from W. to E., within certain limits, and

* See list of miocene flora and fauna given in the body of the present work.

probably on or near the same parallel of latitude. In 1663 it was due north of Paris : it then advanced westwardly till about 1819, when it returned eastwardly, in which direction it is still moving, and Bond supposes that the eastern limit will be reached in about 2140. There are so many resemblances and analogies between the secular and local distribution of the elements of terrestrial magnetism and heat that many persons are convinced that there is an intimate connection between them. The magnetic Pole lies near the region of greatest mean cold, and its course appears to be along the zone of lowest mean temperature. Auroras are believed to be essentially the results of magnetic disturbance, and originate, or at any rate are most abundant and energetic along a zone situated on and near the latitude of the magnetic Pole, which is probably that of greatest cold. It is inferred that no auroras are produced north of about 80° ; in other words, that a person at the Pole would see the auroras on the southern sky. The alternate heating and cooling of the Polar area, together with the great difference of temperature between the zone of greatest cold and the tropic of the northern hemisphere, would seem an adequate and probable cause for the generation of magnetic currents and storms. The auroras are observed to occur in cycles of varying

intensity and frequency, lasting about eleven years; and these variations seem to coincide with the variations in the number and importance of the spots on the sun, which also run through cycles of about eleven years. According to Mr. Meldrum the cyclones of the Indian Ocean also occur in eleven yearly cycles, during which their frequency and strength coincide with the condition of the solar spots. He also infers, from a careful examination of the meteorological reports of various places, that in the countries surrounding the Indian Ocean, such as Ceylon, Mauritius, Adelaide, &c., the rainfall periodicity corresponds with the cyclone periodicity; and that the years of maximum rainfall correspond with the years of maximum sun-spot frequency, while the years of minimum sun-spot frequency are those of minimum rainfall. These remarks suggest that the observation of the climatic and telluro-magnetic elements in Polar regions would lead to results of the highest scientific importance, which would also be of great practical benefit. This object alone should be a sufficient answer to those who want to know what use there may be in Polar research. The scientific man knows that no well-conducted inquiry is useless; and that the electric telegraph, the steam-engine, the galvanic battery, and numerous other inventions of unques-

tionable practical importance originated in apparently useless inquiries.

The phenomena and distribution of Arctic ice are subjects worthy of investigation. It does not answer our purpose to detail the numerous observations made by Arctic voyagers. These observations indicate that the icebergs and ice-fields are loosened every summer, and sent drifting southward. These masses accumulate most where there is most land, and by their melting they transfer the cold of higher latitudes to these more southern lands, and thus reduce their mean temperature. This has the effect of throwing the zone of greatest cold towards the south, especially where the lands advance far north. Observations upon the thickness of ice found each winter or each year at several localities would enable us to define the zone of greatest cold, and also infer from the thickness of the ice whether the regions around the Pole are warmer than in about 75° N. What are the regions of perennial ice? for that there are such regions seems clear from the occurrence of sea ice in sheets formed of annual layers. These regions may be the true sources of the cold currents of the sea; while the warm currents have a temperature of 40° or 45° F., and flowing from the north, may arise from the area where the sea is freed every year from ice by the

summer heat. This is a conjecture, but, probably, as good a one as that advanced by some, that the Gulf Stream flows right across the Pole, that is, by Spitzbergen, and out again through Smith Sound and Behring Strait. The ice presses against the northern coasts, and where the passages to the south are narrow, blocks them up with ice. On either view the evidence is in favour of a continuous sea across the Pole; for if the Gulf Stream flows across the polar area there must be sea, and where the water is not perceptibly cooled, probably open sea. The idea seems, however, to be preposterous. On the other hand the outflow of warm water in all directions from the Pole involves a large and open sea around the Pole.

In zoology and botany something has been done, but there is much more to do. The facts to be discovered cannot fail to have an important influence on all theories connected with their present and past distribution. This has been well shown in the case of botany by Dr. Hooker, whose remarks we quote. He referred to the existing flora of Greenland as being one of the most poverty-stricken in the globe, and yet possessed of unusual interest. "It consists of some 300 kinds of flowering plants (besides a very large number of mosses, algæ, lichens, &c.), and presented the following peculiarities :—(1.) The flowering plants were,

almost without exception, natives of the Scandinavian peninsula. (2.) There was in the Greenland flora scarcely any admixture of American types, which, nevertheless, were found on the opposite coast of Labrador and the Polar Islands. (3.) A considerable proportion of the common Greenland plants were nowhere found in Labrador and the Polar Islands; nor, indeed, elsewhere in the New World. (4.) The parts of Greenland south of the Arctic circle, though warmer than those north of it, and presenting a coast 400 miles long, contained scarcely any plants not found to the north of that circle. (5.) A considerable number of Scandinavian plants, which are not natives of Greenland, are nevertheless natives of Labrador and the Polar Islands. (6.) Certain Greenland and Scandinavian plants, which are nowhere found in the Polar plains, Labrador, or Canada, reappear at considerable elevations on the White, and the Alleghany, and other mountains of the United States. No other flora known to naturalists presents such a remarkable combination of peculiar features as this, and the only solution hitherto offered is not yet fully accepted. It is that the Scandinavian flora (which had been shown by himself to be one of the oldest on the globe,) did, during the warm period preceding the glacial—a period warmer than the present—extend in force over

the Polar regions, including Greenland, the Polar American Islands, and probably much now-submerged land in places connected or lying between Greenland and Scandinavia, at which time Greenland no doubt presented a much richer Scandinavian flora than it now does. On the accession of the glacial period this flora would be driven slowly southward, down, to the extremity of the Greenland peninsula in its longitude, and down to the latitude of the Alleghanies and the White Mountains in their longitudes. The effect in Greenland would be to leave there only the more Arctic forms of vegetation unchanged in habits or features, the rest being, as it were, driven into the sea. But the effect on the American continent would be to bring the Scandinavian flora into competition with an American flora that preoccupied the lands into which it was driven. On the decline of the glacial epoch, Greenland, being a peninsula, would be repeopled with plants only by the northward migration of the purely Scandinavian species, that had previously been driven into its southern extremity; and the result would be a uniform Scandinavian flora throughout its length, and this an Arctic one from north to south. But in America a very different state of things would supervene; the Scandinavian plants would not only migrate north, but ascend the

Alleghanies, White Mountains, &c.; and the result would be, that, on the one hand, many Scandinavian plants which had been driven out of Greenland, but were preserved in the United States, would reappear on the Polar Islands and Labrador, accompanied with sundry American mountain types; and, on the other, that a few Greenland Scandinavian types which had been lost in the struggle with the American types during their northward migration, and which hence do not reappear in Labrador and the Polar Islands, might well be preserved in the Alleghanies and White Mountains. And, lastly, that a number of Scandinavian plants which had changed their form or habit during the migration in America in conflict with the American types, would appear in the Polar Islands as American varieties or representative species of Scandinavian plants. Whether or not his be a true hypothesis, it embraces all the facts; and botanists look anxiously to further explorations in the northern parts of Greenland for more light on the subject, and especially for evidence of rising or sinking of the land, and for evidence of ancient connection between Greenland and Scandinavia; for observations on the temperature, direction, and depth of transporting currents in these seas, and on the habits of the ruminant migrating animals that may have influenced the dis-

tribution of the vegetation by transporting the seeds. Such facts as those of the existence of ancient forests in what are now Arctic regions, and of the migration of existing flora over lands now bound fast in perpetual ice, appear to some naturalists to call for vaster changes than can be brought about by a redisposition of the geographical limits of land and sea, and to afford evidence of changes in the direction of the earth's axis to the plane of its orbit, and perhaps of variations in the ellipticity of the orbit itself."

In mineralogy perhaps the most interesting discovery has been the masses of iron found at Ovifath. They have all the characteristics regarded as distinctive of meteoric iron, and, by most authorities, they are regarded as such. If this view is right, these masses of iron constitute the heaviest and oldest collection yet discovered of the actual matter of extra-telluric worlds. They are remarkable amongst meteoric irons for the large proportion of carbonaceous matter associated with it. From the position in which these masses occurred, it seems probable that they formed part of a large fall of meteoric iron during the miocene period. In 1872 the Swedish government sent a ship out to convey these masses to Sweden. The largest weighed twenty-one, eight, and four tons respectively. Meteoric iron had been previously found

near Upernavik, at Niakornik, Fortune Bay, Fiskernars, and Jakobshavn.

The present knowledge we have of the anthropology of the Arctic regions is a warranty that further researches there would lead to a considerable increase of that knowledge. There are indications of human beings or of human habitations in the most northern lands yet visited; and probably they live or have lived in the undiscovered lands to the north. People live in 80° N. on the west coast of Greenland, and they formerly did at 76° N. on the east coast. These two points are 600 miles apart. On the west coast there is a tribe, commonly called the Arctic Highlanders, which occupies about 600 miles of sea coast. They are unable to advance farther south or north, in consequence of two large glaciers entering the sea, which prove to be impassable barriers to them. And they cannot pass far into the interior owing to the Sernik Soak, or Great Ice wall. They asserted that Ross's ship could not have come from the south because there was nothing but ice in that direction; and although they also told Kane that no people existed farther north, they had a tradition that there were herds of musk oxen far to the north on an island in an iceless sea. That natives have been to the north of the Humboldt glacier is proved by the bone sledge-runner

found by Morton. On the east side the natives seen in 76° N., in 1823, would find the icy shore and lands to the south an impassable barrier in that direction. In 1869 the natives could not be found, although their deserted habitations were visible, and musk oxen, &c., abounded. These facts render it probable that these natives, or rather their descendants, have gone north of 76°, while the musk oxen and other animals have come from the north. Probably, too, there is a tract of habitable land between the district north of the Humboldt glacier and the east coast of Greenland, in 76° N. And probably also there are natives in these high northern regions who have been isolated from other tribes for many centuries. On the Parry Islands every bay and cape yields evidences of a large population where now the region is deserted.

The following summary will suffice to show that the exploration of the Polar regions cannot fail to have a most important influence in advancing almost every science. What man is bold enough to assert that science is absolutely useless? What man, even the most utilitarian, would advocate the abolition of all science as the best means to increase wealth, or to promote the welfare of nations? Let us hope there are few such men. Let us also hope there are many who will lend a hand to removing the obstructions,

official and national, which impede the pursuit of Arctic researches by Britons. Whilst we maintain that the Spitzbergen route is by far the easiest, we are by no means blind to the fact that there are several routes to the Pole, and something may be said in favour of each, and there is no reason why exploration should not be conducted along all. Next to investigating the lands which have already been discovered, the most important thing to be done is to acquire a general knowledge of the Polar region itself. This can best be accomplished by simply attempting to reach the Pole by the easiest route, leaving the more leisurely and time-absorbing scientific explorations to future expeditions. There are three ways into the Arctic Ocean, viz., through Behring Strait, through Baffin Bay, and through the Spitzbergen Gap. The objections to Behring Straits are that the distance from England is so great, that the expense and time required would be greater by that route than the others; that the ice presents greater difficulties there; and that ships which have gone by this route have not been able to advance so far north as by the others. Similar objections may be made to the Baffin Bay and Smith Sound route as compared with that by Spitzbergen. It would involve a greater expenditure of time and money. The ships would have more diffi-

culty in reaching Smith Sound than in reaching Spitzbergen; and when there they would not only be farther away from home, but would have far more difficulty in communicating with the mother country. No ship has ever harboured through the winter farther north than 78° 38′ N., and only one has reached beyond 80°. The most northerly point reached is 81° 35″. There is a probability that land occurs farther north, and hence that the ice will present difficulties in consequence of being piled and accumulated against the northern coast. If the ships cannot gain the open water of Kennedy Channel, recourse must be had to foot and sledge travelling. There is no proof that the land extends to the Pole, nor that the ice does so. If there is a discontinuity of ice and land the sledge parties will have a special difficulty in reaching the point they aim for. The absence or rarity of icebergs in Kennedy Channel may be due either to a small development of land in the Polar sea, or, if there are lands, to the fact that they do not develop glaciers, which can only be formed in regions of perennial ice. The Spitzbergen route certainly must be the best of all for the purpose mentioned; but, in addition to this, it has, like the Smith Sound route, special attractions to a scientific expedition. In favour of this route it may be said that it is the direct and nearest way to the Pole from England; that

there is easy communication between Spitzbergen and England for many months in the year, or from about May to September or October. A ship can easily find a winter harbour as far north as 80° or even 80° 30′ N. Ships have reached 81° 42′ N., and men have reached 82° 30′ N. If past efforts have resulted in the greatest advance north by this route, it seems probable that future attempts will also be more successful by this route than by the others. The failures to reach the Pole by this route have frequently been brought forward as an objection; but this objection equally applies to the Smith Sound route. The special advantage attached to this route is that, owing to its being the broadest gateway to the Pole, the Polar ice flows outwardly in greater quantity than by the others. This renders it probable that the ice zone is narrowest on this side, since more of it is able to escape to the southern seas to be melted, whereas, on the other side, much ice is arrested by land. The warm flow from the Atlantic also has an influence in lessening the formation and accumulation of ice within the Arctic circle. The flow of warm water from the Pole may conjecturally be inferred to be more voluminous in this direction than any other, which would have the double effect of narrowing the ice-band and of rendering it brittle in structure and more easily penetrable.

CHAPTER I.

"Fond men! if we believe that men do live
Under the zenith of both frozen poles,
Though none come thence advertisement to give,
Why bear we not the like faith of our souls?"
SIR JOHN DAVIS'S "*Nosce te ipsum*," 1596.

AN invitation from a friend, casually given, to join him in two days' time, at the Port of Hull, from whence he intended to sail on a summer cruise to the far north in his schooner-yacht, left but little time to make the necessary arrangements for an undertaking of this kind; but the desire to see for ourselves such wonders of the Arctic seas as fill all books of Arctic enterprise so far out of the beaten track of modern travel,—made peculiarly interesting at the present time, when the question of Arctic exploration is uppermost in the minds of men all over Europe, now that the question has been rendered doubly important by the general inquiry respecting the action and influence of the Gulf Stream in the higher latitudes,—overcame all our scruples on the score of shortness of notice, and we accepted the offer without much hesitation. All our

available time was, therefore, devoted to the selection of a suitable outfit, such as our then limited knowledge of these seas suggested. We calculated on a journey of some months' duration, with a lurking apprehension of a possibility of having to winter somewhere in the—by all accounts—inhospitable region, where, if people are once "beset," they must prepare to endure unspeakable privations. We laid in, on this account, many sea stores, which in our haste seemed to us absolutely essential for such a contingency, and others besides, that, had we more time at our disposal, might fairly have been dispensed with.

We hastened to say good-bye to such of our friends as we considered might take some slight interest in our welfare, and from them we received in turn hearty assurance of good wishes, with predictions that the voyage we were about to enter upon could not fail to be full of pleasurable enjoyment of every kind.

We were at Hull at the time appointed, and there we found the splendid schooner-yacht, in the care of the worthy harbour-master of that busy place, at whose hands our good ship was receiving the last finishing touches previous to starting on her voyage. To him had been confided the overlooking of all the manifold requirements of the undertaking, and Captain Wells, an old whaling captain, who had gathered experience

in many Arctic voyages, seemed to take a special pride in the work he was busy upon. At one time he actually determined to resign his official post for a season, and come with us; the Trinity Board, entering fully into the spirit that actuated him, agreed to keep his office, by deputy, during his absence. But the fates ruled otherwise; he has given hostages to fortune, and his wife and family held him back. We were the losers by this resolve, for his great experience in the navigation of the northern seas, coupled with his knowledge of the curious and ever-changing phenomena of the Arctic weather in relation to the movements of the ice in the far north (a knowledge to be gained only by long experience and the keenest interest in the subject) would have been to us of the greatest possible value; for it is needless to say, that there is no book existing, except, perhaps, the valuable contributions of Scoresby, from whose pages we could hope to draw the requisite instructions to guide us in moments of difficulty or danger, much less to direct us in the course we should pursue when in doubt. These old whaling captains alone possess the requisite knowledge at the present time, and men of science have but little opportunity of formulating the valuable observations in daily use amongst these hardy explorers, won by long acquaintance with the dangers to which they are daily exposed;

the more intelligent passing unscathed, while the less observant are compelled to struggle on in hopeless mazes, which too often render their venture fruitless, if no worse fate attends them, as we will have occasion to mention further on.

It may be well to mention that our friend had in the previous year sailed to the north of Spitzbergen, and in lat. 81° 24′ had seen open water and islands to the north-east of Spitzbergen; but his intention was, on the present occasion, if the season would admit of it, to advance still further north, and on his return voyage, if possible, to coast along the east side of Spitzbergen, and after rounding the north-east point to circumnavigate the island, a feat which had never yet been accomplished except by Barentz, two hundred and seventy-five years ago. It must be remembered that in those days navigators had not in use such instruments for observation as we now possess, to enable them to navigate a ship and determine the position of the land, which, as far as the east coast is concerned, is but poorly dealt with by the chart-makers. For many years the whaling captains who continue to contribute fresh facts respecting the land, have only added to our ignorance by suggesting corrections which make confusion worse confounded, by reporting their views upon the actual position of the places they have visited, on their

return home. The main object of our voyage however, the principal, and to our idea the most essential to modern science, was the following up of the observations commenced by our friend in the preceding year. He had noticed in the course of some deep-sea sounding experiments, that the water is of a high temperature at a depth of 400 fathoms, showing a difference of 9° at that depth when compared with the temperature at the surface ; a fact so extraordinary as to lead scientific men to assume that this, our assertion, is so contrary to the laws laid down by modern savans, that they do not hesitate to declare that the statement we made was impossible to be received. To confirm these observations, then, was the main purpose of our journey this year (1872).

One word respecting our schooner: rigged with the usual foresail, topsail, and top-gallant sail, three jibs, fore-trysail and mainsail, she differed at first sight in no way from an ordinary pleasure yacht; but a second glance at her heavy spars, her massive bows supported with stout iron bands firmly bolted to her stem, and extending round the bluff of her bows to about twelve feet aft, evidently to protect her in encounters with the ice, her false gripe, to give her plenty of fore-reach, convinced us that the work cut out for her was no child's play. Looking closer, we found her frame was coated

with double planking, to offer the strongest resistance that could be devised to protect her from the grinding pressure of the ice,—and an inspection of her interior confirmed our readily-formed opinion: her ribs and strengthening pieces were extra strong. We soon gathered from her general aspect, that she was built for strength combined with speed.

In her former most prosperous voyage she was manned, on some mistaken theory, with a crew of Norwegian whale-fishers, but the superstitious fears of these curious people overcame every attempt to prosecute a voyage so well begun, and our friend was most reluctantly compelled to relinquish an opportunity of sailing into the sea whose very existence is denied by some, although the season was of rare suitability for such an exploit.

Quite a crowd of people composed of the friends of the hardy sailors who are to accompany us, and of others, nautically inclined, who seem to take a lively interest in a journey they do not hesitate to speculate on freely, all day long stand loitering about the schooner. They seemed never to grow weary in watching our operations, and we marvelled that so many hands could be spared in so busy a place, where there should be occupation for everybody; but a kind of fascination held them to the spot, and when

everything was complete, and we were actually being towed away from these earnest onlookers, they were compelled reluctantly to leave off gazing on a ship about to sail round Spitzbergen.

The schooner and such attractions as Hull has to offer to a stranger so distracted our attention we hardly noticed the time slipping by. The 11th of May came at last, with a cold northerly wind and heavy rain, arguments which left no other alternative for us than the necessity of waiting for a favourable change. While we waited, Mr. Rickaby returned home from a sealing expedition to the west ice, between Jan Mayen's Island and Greenland, where he had been fortunate enough to secure, in lat. 73° north, some seven thousand seals. He had difficulties to contend with in this voyage, of no small degree. Frozen for three weeks in the pack that surrounded them, they drifted south as far as Iceland, but at length the ice gave way, and they were once more set free.

The pursuit of the seal at this early season (in March) is, therefore, an enterprise not unattended with danger —but the tempting wages paid to needy and adventurous seamen on successful voyages always secures a crew, while the awful experiences of those who have escaped from former hazardous expeditions at this season of the year, seem to have little or no effect

upon the men themselves or their ready listeners. Only in the previous year thirty-two American whale-ships were beset, and their crews fearing to be compelled to endure all the horrors of an Arctic winter in ships but ill-provided with the necessary provisions, left them, and travelled over the ice to their more fortunate companions who were safe on the outside of the floe, and so escaped with their lives, only too glad to leave their own vessels to the mercy of the ice, and the savage onslaughts of the storms of the Arctic seas.

On Monday, the 13th of May, the warps are ready, a steam-tug has taken a final hold of the *Samson* to tow her out. The wharf is still lined with the same people; there, in the crowd, are the wives and families of the married portion of the crew. The surging mass raise a parting shout as we slowly move towards the entrance of the dock, and hurrying to the next point of vantage, give many another hearty cheer, which told us plainly that their anxious and best wishes are sincerely with us.

We have Captain Wells on board, and he seems, even at the last moment, more than half resolved to come with us, but the ties of home are too strong upon him, and he fills up all the short remaining time at his disposal in giving final instructions, and many scraps of valuable advice. He explains many important facts

to be always kept in view, and as he fears they may be forgotten when occasion will demand their most careful attention, these, with other hints of equal value for our guidance, he has carefully written down and presented to us. We distinctly remember one solemn warning he gave us against too hastily landing upon ice, or even ice-bergs, in pursuit of game, and told us that once he himself had incautiously stepped on to a huge mass, with the intention of shooting an Arctic bear, when the great berg, so finely balanced in the sea that it needed but the addition of his weight to make it come crashing down with an awful noise, toppled over into the sea. The sea itself was lashed into a fury by the fall, and in the confusion that ensued he narrowly escaped being drowned. These enormous masses of ice often rolled over as we gazed upon them, owing to the water, being warmer below, causing the ice to thaw more rapidly, when the upper part, which is heavier, totters, the ice beneath is suddenly overbalanced, and the portion that was lately submerged is now suddenly tilted into the air through the disturbance of the equilibrium of the mass. At last the time came to part with our gallant friend, and our attention being drawn off from the receding tug-boat, we began to notice the fact that our schooner was already battling bravely with a high and heavy sea, the result of

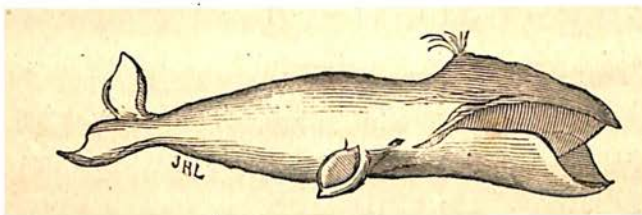
the recent gales. "Dinner, sir!" says the French cook, adding in a strong north country accent, "it's right good stuff." We quickly put away the thoughts the parting has sent crowding into our brain, and we do our best to conceal our feelings. Few men at such a moment can be totally indifferent at starting for a long journey, especially when the leave-taking culminates in a tumbling sea. There are emotions at such a time which the untravelled Englishman has never experienced. Such a one knows nothing of the strange sensation of sailing away from home and friends, league after league, day after day over a wide waste of sea, to another zone where every object to which use has made him familiar, gives place to new phases of nature, wearing for him a totally different aspect—to distant regions he may be familiar with, no doubt, from the perusal of books whose pages depict vividly the scenes they describe; but, after all, book descriptions, however good, fall very short when attempting to convey impressions which experience alone can supply. All our efforts to overcome the obstinate resistance of the gale which now rages from the north proving quite ineffectual, we are compelled to run in again and seek shelter. We anchor under the lee, with a crowd of other craft, who, like ourselves, are waiting for the wind. As the day breaks

on Tuesday morning the whole fleet is again in motion, all being evidently as anxious as we are to get away, and the scene is a stirring one as the sails are once more shaken out to the morning breeze. The fishing smacks lay a little closer to the wind, but we soon overreach them, and the fine sailing qualities of our schooner are soon evident to all. There is a kind of pardonable pride in such a display, and we revel in our success over our unknown opponents.

The wind blows fresh, and the sea runs high, but the schooner tops the waves in gallant style, and the race grows exciting as we quickly outrun each sail in turn; once fairly on our way, we notice that the fishermen haul off towards their fishing-banks, while the merchantmen who hold on our course are evidently bound like ourselves due north.

Now we turn to the men on board, and listen to the tales of daring they have to tell, so different in character to the usual experiences of men whose lot it is to sail in lower latitudes; here the talk is of adventures with whales, and amongst the ice-bergs, their shipwrecks and disasters of every kind. Often it happens that the ships they sail in are badly found, wanting in the commonest necessaries of life, and but ill-adapted for the purpose they are intended to serve. From the accounts we listen to of whaling adventures we soon

learn enough to gather that these voyages have in no wise fallen off in point of interest since the earliest exploits in these seas were recorded. Eddy and Byers (our harpooners) told us of one encounter



with a whale in a previous voyage, when the boat, ere Eddy could strike with his harpoon, was capsized by the sudden rising of the whale beneath her, and in a moment the crew and all her gear were hurled a few feet into the air.

Byers, too, had a somewhat similar misadventure, but in his case, as he was preparing to let drive at a stricken whale, she struck violently with her enormous tail (we shall have something to say of whales' tails presently), carrying away all the gunwale of the boat with one terrific blow, and had it not been for the harpoon lines which are always coiled down in the open spaces between the seats of the whale boat, and which served as a fender to the stroke, they might have suffered still greater damage; as it was, they managed to escape with only a ducking in the icy sea, owing to the ready assistance of their more for-

tunate companions, who by good luck were close at hand in the second boat; but for this the adventure might have had a still more serious ending, their ship, as often happens, being away a considerable distance at the time.

The wind again veered round to the north, and as there was but little use in contending with a high sea, with opposing wind and tide, and weather bitterly cold and wet, we concluded that a visit to Edinburgh for a day or two would make an agreeable change, and, without more ado, put into Leith Roads, where we made everything secure. Once again we are under weigh, and scudding before a pleasant breeze, we pass the Bell Rock Lighthouse, which now supplies the necessary warning formerly given by the famous Bell, whose curious history is recorded by Robert Southey, in his story of "Ralph the Rover." The abbots of Aberbrothock seeing the constantly recurring accidents to ships approaching these Roads, had a bell constructed, whose tongue would be kept in continual motion by the action of the waves. The rover, who bore some spite against the brotherhood, stole the bell, and of course got wrecked himself upon the very spot.

The adverse wind threatens to oppose us continually, but as we are equally determined to proceed, we make light of the "blustering railer," and go on

board; when, as if to perplex us by its inconstancy, it falls a calm; a calm day at sea is at such a juncture a greater affliction to men who are impatient to proceed than can well be imagined; we resort to all kinds of occupations to beguile the time, fishing lines are produced from the ship's stores, and we try for cod-fish, but our success is trifling; presently an old sailor produces a crafty-looking combination of hooks bound together with some shining white metal; this he rigs up after a fashion adopted by the Norwegian fishermen, and he lets it down a considerable depth into the sea—with a sudden jerk he swings his hand which grasps the line into the air, and then lets the weight subside again; this action is repeated for some time, when he is at length rewarded by the capture of a fine fish—not fairly hooked of course—but the barbed hooks, coming in sudden contact with a passing fish, probably attracted by the shining metal, sink deeply into the quivering side of the incautious codling, and he is hauled on board. We have many times seen the savage islanders of the Southern Ocean succeed in this very way; but for ourselves, we never could adopt so un-English and so unsportsmanlike a method.

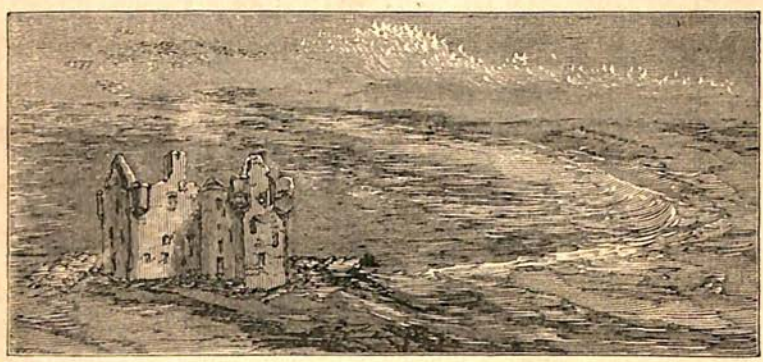
At the break of day inspecting our collection of telescopes and eye-glasses to test their various merits,

we sight some sailing vessels in the far distance, and although we have not as yet seen the "northern lights," the atmosphere presents a remarkable, and to us entirely novel aspect: the cloudless air is filled with prismatic reflections, by turns pale white, and then yellow, and green. The older hands declare that it portends an easterly wind if seen further north; but here, so far south, it surely indicates that the pack ice is well south.

The 25th of May finds us to the southward of the Shetlands, and we hope to make the south entrance of Lerwick Harbour before twelve next day. The north entrance is narrow and studded with rocks; and our chart was somewhat old; we passed the south entrance during the night, having made a bad land fall; the wind had shifted, then having daylight with us, we essayed the northern entrance, luckily with no worse accident than a slight graze against an unseen rock; but we are glad it is no worse, and soon forget the misadventure as we land in this pretty little fishing-town. The place reminds us of the well-remembered lines:—

> "Within a long recess there lies a bay,
> An island shades it from the rolling sea,
> And forms a port secure for ships to ride.
> Broke by the jutting land, on either side
> In double streams, the briny waters glide
> Between two rows of rocks."

Here we procure wood, water, supplies of fresh food, and additional men for our crew. Here, too, as the weather was unpropitious, we determined to see the few objects of historic interest the place could boast of, and with this object in view set out after church



to explore the ruins of Scalloway Castle, an old feudal stronghold of the Stewarts. A matter of seven miles seemed to us of no account, and after a reasonable time had been devoted to the expedition, we inquired at a neighbouring farm-house, where we discovered we were far out of our way. Crossing the hills to regain our course, we soon lost our way in a fog, and but for the kindly assistance of a shepherd we found by chance in his lonely hut, we should have fared even worse perhaps. It was not until after five hours were spent in wandering in the direction of the ruin, that we found ourselves beneath the walls of this ancient keep, and as it had been raining all the time of

our weary search, we were in but little mood for hearing the tales of the garrulous old lady who did the honours of the place. From her we gathered some curious popular traditions respecting the building of the pile, and declining her invitation to foregather round her peat fire, and enjoy what humble fare she had to offer, we inspected such details of the mediæval Celtic architecture as remained; we saw the solid arches on which the upper stories of the building rested; and while we speculated on the use of the usual turreted extremities of the structure so common in early Scottish buildings, the guide ran on with her quaint account of the merciless exactions of the founder, who compelled all his lieges to supply sufficient *white of egg* of the sea-fowl, which abound in these islands, to temper his mortar, in the hopes of rendering his donjon impervious to the onslaught of his enemies, or the wearing tooth of time, giving the refractory the alternative of hanging if they declined to assist. After we had satisfied ourselves with a survey of the ancient castle, we requested the worthy dame to let us see some samples of her skill in Shetland wool-work, but she as persistently declined to offer any of her work for our inspection, fearing that we should tempt her to trade with us on the Sabbath day.

We learned afterwards that about the year 1600, Earl Patrick, of Orkney, commenced the erection of Scalloway castle, and it is scarcely possible to conceive a more flagrant exercise of oppression than that which really occurred during the erection of this structure. This

> "Fellow by the hand of nature mark'd,
> Quoted and sign'd, to do a deed of shame,"

laid a tax upon each parish in the county, obliging the Shetlanders to find as many men as were required for the building, as well as furnish provisions for the workmen. The penalty for not fulfilling this requisition was forfeiture of property. The building was soon perfected; its turreted walls rising from the naked shores of Hialtland with all the feudal haughtiness of a regular baronial mansion, appearing to mock the humble habitations of the ancient udallers.

It is said that when the pious minister of the parish came to pay his respects to the lord of the new mansion, he was called upon for a suitable text to affix to the stone forming the frontispiece of the house, and without fear, "remembering the sinful enormity of that overbearing oppression which had enforced its structure," quoted the parable of the house built on a rock, and that constructed on sand, to the dismay of his host. At first he resolved to condemn the poor

man to instant imprisonment; but afterwards a compromise was effected, and the result was the following inscription, which is still partly legible :—

PATRICIUS STEWARDUS, ORCADIÆ ET ZETLANDIÆ
COMES, I.V.R.S.,
Cujus fundamen. saxum est, Dom. illa manebit,
. . . labilis e contra, si sit arena perit.
A.D. 1600.

This Patrick Stewart eventually was deservedly executed for some, or more likely for all, the crimes he had been guilty of.

During our short stay at Lerwick, we learned many other curious particulars respecting the ancient habits and customs of this remote branch of the Celtic family, and being limited for time, instead of visiting, as we gladly would have done, the many curious records of remote antiquity which are plentifully scattered over the islands in the shape of mounds, circles, runic stones, ancient tower churches, inscribed memorials, "standing stones," and other antiquarian objects, we sat and listened to tales of witchcraft, the influences of the "evil eye," and other abominations of the "good old times." We endured also the depressing effects of stories of savagery committed by the feudal chiefs, that only equalled, though they do not surpass in barbarous injustice, the revolting and iniquitous state

of things known as the "truck system," which is rife at the present hour amongst these industrious people.

Gladly did we turn from these horrors to listen to the story of the Orkney man Einar, who is deservedly regarded as the great benefactor of the Shetlands, inasmuch as to him is attributed the discovery of peat fuel—a substitute for wood or coal. At the present day, when the peat is removed—as we saw the operation performed—in many places the gravel which underlies this deposit is thickly covered with the roots of hazel, willow, and birch trees, proving that this treeless region was once blessed with umbrageous woods. To Einar the people owed their comfortable fires during the long winter season; in return, the grateful Shetlanders almost deified their benefactor, and to this day he is known as Torf Einar. We heard, too, of the long suffering, patient endurance of the martyr St. Magnus, of the thirteenth century, whose fame is preserved by the church dedicated to him, and the Bay which bears his name.

This little town of Lerwick is as quaint a place to stop at as the traveller will find anywhere. The houses are inconveniently crowded together, some stand on the margin of the water, and the narrow passages which serve as streets are so ill contrived they but add to the

general confusion; steep flights of stairs, and houses on opposite sides actually joined together above, span the thoroughfares in many places. The hotel is situated in one of these narrow ways, or "entries" as they are called. While we were there, the whole village wore a busy aspect, which may have been unusual; certainly the cause was not far to seek, for two hundred of the inhabitants, grown weary, perhaps, of the continual privations they were forced to endure during the long winter, had resolved to emigrate, and the town was filled with their friends, who had come in from the country round to wish them God speed on their setting out for better fortunes in the New World.

When the hour for parting came the men did not show unwillingness to leave, but the new accessions to our crew had little time to get their things together, and overstayed their time. We had secured the services of a carpenter and four additional hands, so that our party now numbered seventeen people, and, judging from appearances, we were likely enough to have a pleasant time of it in the north, where there would be plenty of sport; if the formidable array of whaling and sealing weapons, as well as the well appointed armoury, could be any guarantee for our success. We have much serious work to occupy us as well; the many costly scientific instruments plainly indicate this

fact, as they are being stowed away with the care and attention such things so imperatively demand.

The water-tanks we brought with us, capable of holding forty tons, were soon filled; these receptacles were destined eventually to carry the oil and blubber of such animals as we might be fortunate enough to capture on our way. On the 28th of May we were ready for the sea, but the men seemed evidently anxious to linger as much as possible along shore, and all our efforts to draw them away from such allurements as held them enthralled proved unavailing; until we hit upon a plan which soon brought them to their senses. We declared our intention of sailing at a certain hour, and without waiting to comply with the thousand appeals made to us for further time, we were up and off. Strange what alacrity was shown when they discovered we were in earnest.

There was only one poor fellow amongst them who manifested the slightest trace of jollity in his composition, and he was overcome with drink. From the incoherent scraps of the song he sung, we concluded he came deeply moved from a recent parting scene with some young Shetland lass. We watched him as he made frantic efforts to keep his legs, and heard him endeavour to lilt out a dolorous love ditty at the same time.

One old fellow wearing a crafty look, who appeared very destitute indeed, declared that he had lost two whole days in anxiously looking out for our arrival, that he hoped we would employ him as pilot; and, after three hours' persistently appealing for the berth, he obtained his object; but, the moment he gained this advantage, he made the fullest use of it by charging an exorbitant price for his services.

Then we got away; and, instead of going outside, we went through the northern passage. Any one desirous of comprehending the strange scenery of this coast will find curious information in the pages of the poet Drayton, in his "Poly-olbion," who thus invoked the local genius of the Shetland Archipelago, whom Scandinavian writers, *prisco sermone*, were wont to name Hialtlandia:—

> "Go thou before us, still thy circling shores about,
> And in this wandering maze help to conduct us out,—
> Wise Genius! by thy help, that so we may descry
> How thy fair mountains stand, and how thy valleys lie."

We need hardly, then, dilate upon the run our schooner made through this intricate passage. Fitful Head was rendered strangely weird-looking in the distance by a wreath of white mist wrapped around it like a solid-looking covering. The continual change of scenery, as we bore up against the strong current

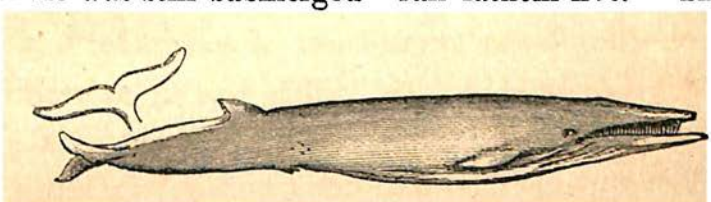
which flows between the rugged rocks on either hand, made this part of the journey most enjoyable; at times we passed from a comparatively calm water into a turbulent sea, whose waves broke upon the jagged faces of the cliff with a fury not to be described. The swell caused by all this commotion gave additional anxiety to such of us as were unused to it, and it was not until we had again escaped from a spot where the least shift of wind would, in spite of all our efforts, have driven us upon a lee-shore, that we began to breathe in security. One of the Shetlanders, who hailed from some place close by, informed us of the wreck of a steamer he had witnessed; she was coming here in very thick weather, and suddenly struck these high cliffs; all on board were lost, except two men who happened to be aloft in the rigging, and who stepped on to the rocks as the vessel went down —reminding us of the story we had heard of the "Carmelan," of Amsterdam, a rich vessel bound for the East Indies, laden with three millions of guilders, and many chests of coined gold, lost here in 1664, but more to the north-east, at the rocks known as the Outskerries. The wreck of this costly cargo happened on a dark night; the look-out men failed to discover their danger until too late to warn their companions; in this case, also, the mast coming down

with the shock fell upon the rocks, and by its aid these four sailors only escaped; the ship went down in deep water and all hands were lost. The casks of costly wine floated out of the wreck, and for twenty days the people along-shore got drunk and grew sober to get drunk again as long as the intoxicating beverages intended for the trade in the far east, supplied their thirsty souls. The Earl of Morton, a great local potentate in those days, got together all the gold it was possible to recover, and a difficulty respecting his right to the flotsam and jetsam with King Charles II. led ultimately to his loss of certain property granted to the family by the Crown. As we proceeded north the sea grew gradually less turbulent; and as soon as we were clear of the land it settled down to its usual regular motion; then we bustled along with a fair wind. Some of the seamen that were "floored" by sea sickness on first meeting with the rough water now shook off its effects, and as they slowly recovered they began to enjoy the rallying they had to endure from their more fortunate shipmates.

To-day, we for the first time saw some "finners" (*Balena antiquorum*), the largest species of whale frequenting these seas; as they bore down upon us they were regarded with seeming indifference by the men, though we gained some curious particulars re-

specting them from Eddie, who noticed us gazing with ill-concealed admiration at the monsters as they neared our schooner. Your "finner" is longer looking, more lithe, and a faster swimmer when compared with the portly gentleman whose broader beam and more abundant oil has gained for him the title of "right whale" (*B. mysticetus*), and we could easily see from his rapid and even graceful motion through the water that he must be a much more difficult quarry to contend with than his more greasy relative, who is so great an object of solicitude to all on board a whale ship. This fellow has an awkward habit of sinking out of reach of his captors for a period of three or four days after he has been killed, and the enforced delay is often rendered futile by the failure of the flukes of the harpoon to take firm hold of the skin. In the interval, between the successful pursuit and its reappearance again upon the surface, the body becomes much distended by the gases generated during its rapid decomposition after death. The men, after risking their lives in the dangerous pursuit, are often deprived of their expected gain by the sinking of the carcass altogether, and when success has crowned their efforts, and the inflated carcass reappears upon the surface of the sea once more, the air above is soon filled by thousands of screaming sea-

birds, attracted to the spot by the tempting prospect of a feast. These dainty-looking denizens of the air squabble and fight amongst themselves for every morsel as it becomes detached from the skin, in the ugly and offensive process of "flencing." But there are other guests at the feast who are much more repulsive-looking and add another element to the sickening operation—we mean the savage and greedy sharks, who have long since commenced the banquet while the whale was still submerged "full fathom five." These



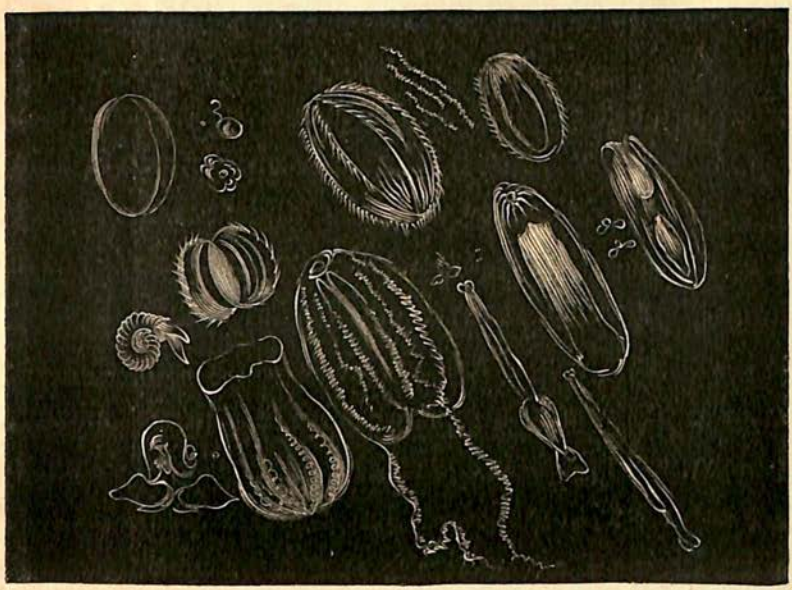
horrid monsters of the sea make sad havoc with their cruel fangs as they dig into the flesh, and even now seem loath to part with what they consider their rightful perquisite, daring even to contend with the busy sailors who are armed with the sharp flencing tools. Often and often the men have to desist from their labour to drive away these frightful assailants, and so unwilling are they to forego the meal once tasted, that sometimes a shark, more greedy than his cruel-eyed companions, will receive what would seem a mortal thrust, and after a momentary dive will appear again amongst his fellows struggling with

and worrying at the unsightly food. It is in the sunny fiords of northern Iceland these finners are now oftenest found, and there in the clear deep water of the beautiful bays indenting the coast they lead a comparatively easy life. Some speculative Americans established in one of these fiords a rather extensive fishing-station, hoping to derive large profits from the systematic pursuit of the finner whale. The undertaking was a disastrous one, and the remains of the deserted factory now encumber the shores of one of the finest natural harbours of that coast. The harpooners are capital sailors, and a few are fair sportsmen; they contribute to the support of their families by making these trips with whalers, when they gain as wages sometimes from £10 to £15 a month; they are usually naval reserve men, and at times they are employed on the works at the Hull docks refitting ships, picking up odd jobs, looking after leaky ships as they come in for shelter in stormy weather, or in hiring gangs of men to clear ships by contract. Such men have the greatest contempt for the Navy—"Why, sir, I can earn as much money as a brass-buttoned lieutenant gets any day, and as for being ordered about by a set of middies who knows nothing they give orders about—no, sir, none of my family enter the Navy; we saw enough of them up

the Straits to see what they were made of." Some of these men have made nineteen or twenty voyages to these seas, and have had too much experience of the pursuit of the finners to make them enthusiasts in their pursuit. One of our men was employed on board a vessel engaged in the capture of this whale when all their fishing tackle was lost; several finners were struck and but one was ultimately secured, so that the outlay was greatly overbalanced by the losses incurred. The oil also, when compared with that of the right whale, is less in quantity, and inferior in quality; it is thin and greasy, while the true whale oil is, when recently collected, of a pale salmon colour and remarkably rich in quality. Towards evening the finners left us.

On calm, clear days, while we waited for the appearance of the whale, we preserved the strictest silence, and as we waited and watched, he would glide on to the surface with a sudden but gentle motion, heaving a loud p-o-o-f as he came; and if on his way either in search of food or swimming in mere sport, we could see the peculiar inclination forwards which formed the first part of the curve in which the drive is made. The odour of a whale is most unpleasant, and he leaves a slimy track behind him, just such a track as some great black slug leaves when passing over the garden path in the early morning; we could also

observe the action of the enormous tail, which differs from that of fishes, in being set on horizontally instead of perpendicularly. There is a slight curve in the surface of each flange, imitated, no doubt, in the construction of a screw propeller for a steamship. By working this enormous limb with an up and down stroke, he is enabled to scull himself along at various



WHALES' FOOD.

rates of speed. Swimming gently along, the fan-like tail moves with a regular rhythmical motion, giving sufficient force to drive the weighty body in the desired direction; but when roused to action this powerful organ is driven with enormous muscular force; then the lobes are more rigidly exerted, and the body acquires

an undulating motion from side to side, somewhat like a wherry propelled with one oar over the stern.

The oil of the *Physalis antiquorum* is calculated at the rate of one ton in ten of the whole weight of the body. The blubber of *Balæna mysticetus* is about one half of all the weight. The finner is leaden-coloured in some lights; but seen directly below the spectator, its body is black, with the chest and throat velvet-brown, and ridged along the under parts with deep plaits, which are of a deeper brown on the outer part of the folds, and a yellowish white within. In an animal measured by my friend Dr. Murie, he found the entire length to be sixty feet; of this the head measured nearly twelve feet.

This species, in common with most of the family *Balænopteridæ*, does not go far north as a rule, says Mr. R. Brown, who has bestowed much time and attention to the collection of valuable facts relating to Arctic zoology in his frequent expeditions. They feed upon cod and other fish, which they devour in immense quantities. Desmoulins mentions 600 being taken out of the stomach of one. Mr. Brown knew an instance in which 800 were found. They often, in common with *Balænoptera gigas* and *B. rostrata*, wander into the European seas in pursuit of cod and herrings; and the skeleton of one recently captured

in the Thames is to be seen at Rosherville Gardens, somewhere down the river—*that* "place to spend a happy day," as we are led to believe by the advertisements at the railway stations.

A few years ago much excitement was got up about the number of "whales" found in the neighbourhood of Kocal (Greenland), and companies were started to kill them, supposing them to be the right whale of commerce. As might have been expected, they proved to be only "finners," which prey on the immense quantity of cod which are found there.

This whale is accounted almost worthless by the whalers, and on account of the small quantity of oil which it yields, and the difficulty of its capture, it is never attacked unless by mistake or through ignorance.

In Davis's Straits one was seen floating, dead; to it the men rowed, taking it for a right whale, but on discovering their mistake they immediately abandoned it. They had apparently not been the first, for on its sides were cut the names of several vessels which had paid it a visit, and did not consider it worth the carriage and fire to try out the oil. The blubber is hard and cartilaginous, not unlike soft glue. Its blowing can be distinguished at a distance by being whiter and lower than that of *Balæna mysticetus*.

Next day, 30th May, the same wind continuing, we are borne with great speed towards the north. All day long another kind of whale swims in our company. This time it is the bottle-nose (*Delphinus deductor*). Five of these fellows play around the bows; diving for a moment, they appear again close to the stern. Their gambols rouse our desire to test the powers of the harpoon-gun; but all hands are now busy with the various preparations for the coming season, and a few rifle shots are fired at them, until one more successful

than the rest at last drives away our companions. The sailors told us that in the autumn small bottle-noses frequent the coasts in pursuit of the herring; and the fishermen, ever on the watch for these the most destructive of their enemies, are prepared to wage a war upon them whenever a fitting opportunity presents itself. The bottle-noses, attracted probably by their prey, often incautiously enter some land-locked bay, and the men, seizing the chance, endeavour by an organised onslaught to drive them ashore. Dashing out in their well-manned boats, they cut off the retreat

of the herd, which is quickly thrown into confusion by a wild hubbub and splashing of water in their rear. The bottle-noses rush wildly from side to side, and some old bull, their leader, his patience exhausted by the frantic efforts he is bound to make for their safety, often rears up in the water to the no small danger of any boat in his immediate neighbourhood. All this time the tide is ebbing away, and the shallow water, grown muddy from the turmoil, impedes the progress of the bewildered whales. One or two, in their frantic charges at the boats, manage to make good their escape, but the majority are soon stranded and made away with by the boatmen, who by an unreasonable law are compelled to concede a third of their gains to the Customs, a similar exaction being made in every case where a harpooned whale is brought to land.

CHAPTER II.

"Dispecta est et Thule."

TACITUS.

OUR boats, to be used by-and-by, are now being overhauled, all hands being busy with their fitting. They are lightly constructed of pinewood, and are carvel-built. Their smooth sides make but little noise as they rise to the waves; for they are coated with zinc on the outer sides, to fend off the ice, which would otherwise injure the wood by its constant grinding. Each extremity is built whale-boat fashion, fine at the end. They are fitted to pull either four or four pair of oars; each oar has a grummet, which to the uninitiated means a pin and a ring. They are steered with an oar instead of the ordinary rudder; they have a mast and sail, and each thwart or bench has its use. These boats offer no accommodation for an idle visitor, and they seem to say in reply to a close inspection, "No admittance here except on business."

There are four whale-lines on board, each equal to 960 yards; these fill the spaces between the thwarts;

forward in the broad bow, there is a bollard or short post fixed firmly to the stem. This is in a line with the notch in the bows, round which the harpooner takes a turn of the line when fast in the whale; another, iron-bound, to carry the swivel-gun of one and a-half inch bore, strong enough to throw a harpoon of ten pounds weight a distance of twenty yards with perfect accuracy. This support is firmly fixed to the keel, the bollard being twisted to enable the running bollard to pass a little to its left.

Then there are the lances, and harpoons of various kinds; one harpoon head having the handle firmly fixed, to which the line is secured; another has the handle made to disengage itself when the harpoon, to which the line is attached, is firmly planted in the hide. The former is used for whale fishing, the latter for striking seals and walrus.

There are besides lances of most formidable proportions, mounted upon long shafts, to strike at the wounded whale when he returns to the surface after his dive of some forty minutes' duration. These weapons rest securely on a suitable receptacle. The oars ply upon well-greased matting, and, owing to this simple arrangement, the boats are propelled without the least noise to disturb the floating monsters.

As the men busy themselves with commendable alacrity, they spin yarns without number of former voyages: their adventures and disasters furnish a never-failing supply of details. Two weather-beaten men told how five winters ago the *Diana*, a steam bark, of Hull, was beset in the ice in Davis' Straits, and how the captain of another vessel agreed with them to stand by each other in every difficulty that might arise. They told of their long and laborious voyage to Lancaster Sound, where they were "nipped" in the ice, and the hatchway of the *Diana* was twisted completely round. Turning south again they were beset in the middle ice, and all these difficulties were encountered by a ship hardly supplied with necessaries for the voyage out. The *Diana* was short also in her coal supply, and when her last bushel was expended and they were forced to rely on their sails alone, they had the misfortune of seeing the ice open and their consort steam away without even offering a helping hand. Their efforts to extricate themselves by the tedious method of warping, proved abortive, and the ice closed in upon them once more, cutting off all chance of escape. All through the long winter months that ensued they patiently waited for the help they expected from companions who might have found some way to their

relief; but in the April following, when they were once more set free, they learned that the man who might have saved them all this woe by one short hour's help, had informed every anxious inquirer that the *Diana* was secure from danger, and needed no assistance from without. Most of the crew survived their difficulties, but the captain and nine of the men were unable to cope with the sufferings of their enforced exile, and died during the winter. The remainder of the men, with tattered clothes, ill-suited to the severity of the climate, reduced to mere skeletons from want of food, and by reason of the sickness induced by their miserable condition, managed somehow to work their tottering bark, crazy and liable every minute to go to the bottom by reason of her injuries; drifting rather than sailing as far south as the Shetlands, some fishermen at length fell in with her in the month of May. These worthy fellows, struck by the miserable appearance of the unfortunate *Diana*, ventured on board, and found the nearly worn-out survivors, some in their beds incapable of helping themselves, others on deck in nearly as sad a plight. They brought the leaky vessel safely into harbour, devoted themselves to the task of restoring the poor fellows to health and to their friends; and we now had two of these *Diana* men on board with us, who,

but for certain indelible marks caused by the exposure and incessant toil at the pumps, seemed as capable of enduring the vicissitudes of many a future year's Arctic voyaging as the ablest seaman on board our schooner.

For two days we have the dense fog thick about us. It is in vain we strain our eyes in the direction of Van Mayen's Island, whose snow-clad peaks of Beerenberg have often been seen at a distance of ninety miles; but we know that we are in the vicinity of land by

the presence of sea-birds on the wing, whose flight is ever round the ship and towards the land we cannot see. Has not Providence placed these winged messengers of warning to protect the heedless sailor from rushing on a dismal fate? This rock-bound rugged

coast lies directly in the ship's course, and as we near their home the whole air is alive with white-winged armies, and the high cliffs are tenanted with another host at rest. It is a place of *marvels*;—as if to mock the wondering crew, two rocks stand out from the land so exactly resembling swift-sailing ships, that even a reference to the chart, where the fact is duly recorded, hardly convinces us of their unreality. On they seem to come with all sail set, and heeling over to the favouring gale. But they are rocks and not ships, after all.

The best known feature of the island of Jan Mayen is the magnificent Peak of Beerenberg. This mountain rises in icy splendour to a height of some six thousand eight hundred and seventy feet above the sea-level.

The coast presents a rocky aspect; in some parts the bold cliffs rise out of the waves, and at such places are altogether inaccessible on the western side. There are, however, several indentations, and amongst these there are many that deserve the name of bays, and in these bays there are many spots where good anchorage can be found. It was here the Dutch formerly made little settlements or fishing stations, at a time when the "right whale" was found at certain seasons along the rocky coast, and at these stations they "tried" down the oil by suitable boiling apparatus erected near

the sea. The bay we entered, on the 3rd of May, was named after a very shrewd Dutch woman, Mary Muss, whose energy and industry entitled her to rank amongst the foremost merchants of Rotterdam in this lucrative trade; this intelligent woman was the first to send a ship provided with all the necessary appliances for boiling the blubber on the coast after the whales were captured, and the oil and whalebone so obtained gained a higher market price than could be obtained after the blubber had lost some of its most valuable qualities by being stowed away in its crude state. Our companion, with one sailor, landed here, whilst we and another ascended a mountain ridge, about a mile to the northwards. On the way we noticed several patches of rich vegetation, and we gathered specimens of the botanical productions, such as they were. One plant we found growing in great abundance, we regarded as a species of saxifrage or arenaria. We had some idea of making a long detour, and of joining our friends at a point somewhere on the eastern slope of the island. But the labour and risk involved in such an adventure was so great, owing to the slippery state of the snowy ledges and the exceedingly rough volcanic nature of the ground, composed for the most part of scoriæ, cinders, and blocks of lava, which crumbled beneath our weight as we endeavoured to force our way over the

uneven surface, that we were soon compelled to relinquish our attempt, so there was nothing for it but to retrace our steps and endeavour by some short cut to join the others on the sandy beach below. Getting down again we struck across a kind of lagoon, rough with frozen snow, called by arctic travellers "bay ice;" for three miles our way lay across this flat, which lies at the base of the mountains, and is fringed by the sea-shore.

We found our friends at length, and enjoyed with them the prospect they were contemplating. A pyramidal rock shot up into the air about 1,200 feet above us; its otherwise bleak and wall-like face was cut up by stratification into a series of narrow ledges inaccessible to all save the winged denizens of the air, who here found a secure resting-place and a nursery where they might bring up their callow brood, safe from the approach of the cunning foxes, evidences of whose presence on the island were to be observed everywhere. We found no difficulty in spreading alarm amongst these airy colonists by throwing stones at the cliff, and when we succeeded in setting on the wing a myriad of sea-fowl, the flocks circling round and passing over our heads really darkened the air above us, and, as they swept along like a thick cloud, wheeling suddenly in their flight, produced a curious effect,—the dull-looking

BRENT GEESE, EIDER DUCKS, AND YOUNG SNOW GOOSE.

Page 95.

mass by a rapid change shone out in the clear air, white as a snowdrift, and then cohort after cohort would float past again in another cloud-like mass. The noise, too, of so many wings, and the wild, scared cries from a host like this, was much greater than could be imagined, much less described in words. The temperature of the water at the surface was 32°, the air 32½° Fahr.

The beach itself was not without its wonders. Here lay scattered an accumulation of flotsam and jetsam, curious in their diversity. We picked up the little glass floats used by the Norwegian herring fishermen for buoying up their drift nets, that had evidently drifted from Iceland; bits of whale-boats, reduced to matchwood by the frightful action of the boisterous seas; fragments of wrecks of ships that once fought bravely against the ice, but, beaten at last in some dread encounter, everywhere lie shattered on these sands; bits of what once had been the masts of merchant ships, now fit for nothing but the fire; huge piles of driftwood, once stately trees on the side of some Siberian river, torn down by one of those periodical inundations which devastate the northern lands of the earth, and, hurried along by the torrent, floated out into the open seas, where the climate is mild enough, and the temperature of the water is

sufficiently high to admit of the existence of the wood-boring *teredos*, such as are found in timber used in ships, marine structures, and driftwood floating on or near the surface. Caught at last in some ocean current, the wood is drifted westwards, and at length finds a resting-place on this desolate coast. These sea-worms cannot live in the Arctic seas, and the driftwood, perforated in every direction with their little tunnels, has long since been rendered tenantless.

As we came near our landing-place, at four o'clock in the Arctic morning, we found that the men during our absence had collected a quantity of dry wood, and, setting fire to it, were busily engaged in spreading a comfortable repast for us after our wanderings; here we found the comfortable odour of coffee diffusing itself over the other good things laid out for our entertainment. It was with no small satisfaction we once more took our places on board our boats, since landing at Jan Mayen is not considered at all times safe. Frequently a sudden gale springs up unexpectedly, and people coming for a few hours are often detained a week on the shore, waiting for a chance of escape, and we were well aware of this fact, as the stores provided for the trip we had just made, were intended for an emergency of the kind.

The wind had not shifted during our short stay,

and there was therefore no surf to hinder our embarking. We made a quick passage to the ship, and having "an imposition of sleep upon us," we turned in for five hours until breakfast time.

Going on deck again, we found the wind still off the land, bringing down with it blasts of air that had become chilled by passing over the frozen mountain-sides to windward of us. High above us rose the icy peak of Beerenberg, as stately a mountain as ever eye gazed upon; its pointed crest, robed with snow, towered above the clouds that cling around it in wreaths of vapour. The water under the steep shore was comparatively calm; we therefore took a boat's crew and landed again, leaving two of the men to look after our boat in our absence.

The soil formed by the washing away of the mountains was heaped up in the neighbourhood of the sea into rich plains, and its richness surprised us. There are two craters marked upon the chart, which at no distant period gave out flames and lava. With difficulty we made our way over the black soil and rugged ridges which opposed themselves to our progress, and, ascending an eminence, we looked towards the sea on the opposite coast, and the craters coming within our range, we at once turned our steps in their direction. The place has greatly changed since Scoresby described it.

For instance, the remarkable rock known by the name of Egg Island, which in his time might have formed a tolerable shelter for a vessel of good size, is now joined to the mountainous shore, and presents an outer surface of about twenty-five feet above the level of high water mark.

We ascended one of the lofty ridges of Beerenberg, whose summit at that moment was perfectly free from clouds, and the prospect was of surpassing grandeur. The sun lit up all its projecting crags, and whenever its direct rays fell upon the snow and ice, the mountain glistened with iridescent colours. A torrent falling from hidden recesses near its summit came down in long leaps, or tumbled amongst the projecting crags, and as it came it froze into rigid icicles; the sunbeams falling on these cascades caused them to glitter and sparkle again. We had never contemplated anything so fairy-like, and at the same time so weird-looking. We had a long ten-hour walk, and were rewarded by the discovery of a hitherto unnoticed crater, whose position we carefully noted. The place was blocked with scoria, which was evidently of recent formation.

Returning to the boat, we found our men in a state of great excitement; they had returned from the chase of a little fox, which had occupied a good part of their

time during our absence. At first they watched the cunning little scoundrel stealing down the cliff, evidently in pursuit of game; taking advantage of every little inequality in the surface which could serve as an ambush, it crept down towards the beach, where some sea-birds were resting. The men watched his every move with eager curiosity, and at last they saw the subtle rascal select his victim—a solitary bird stood preening its feathers, arranging its toilet preparatory to a little sleep, all unconscious of the danger impending; having adjusted its plumage to its satisfaction, the bird quietly settled down to rest, and dozed off quietly to sleep. But a short interval now separated the wily fox from its prey, and running quickly from its place of concealment, it bounded towards the bird, and secured, not the coveted morsel, but a single feather from its tail. Without delay, the sea-bird soared aloft into the air, leaving the baffled fox in a state of evident perplexity. Then began their long-delayed chase of the fox, the wild bird screaming as if in satisfaction, as shot after shot told how eager the pursuit was, how difficult the capture.

The cartridge boxes left with the men for their protection were nearly emptied of their contents early in the day, as the wild duck knew to their cost. And it is to this cause they attributed their failure in the

attempt to capture the first Arctic white fox met with on our journey.

We are unwilling to lose the opportunity of devoting ourselves altogether to a closer survey of the island, as the wind to the eastward makes it a difficult matter to approach the land on that side; to the southward the water is calm, and a black sandy beach invites us, but the sandy beach is "steep to," and is bounded with rough, weather-beaten rocks on either hand; it is not a place for anchorage; we sound and verify our opinion, and beat up without further delay. Broken water extends a long way out from the land, but we see no ice in the offing. As we sailed along with a fair wind we suddenly fell in with the true commencement of the west ice.

Extending far beyond the range of vision, and as we scud along, the fog as it lifts reveals vast plains beyond, still encumbered with these quaint-looking masses of floating, toiling ice. Here is a plain of some twenty square yards burthened with little mounds of ice covered with folds of frozen snow; here is a patch of a hundred square yards more heavily weighted with little hummocks, as the lumps of ice scattered over its surface are called by the Arctic voyagers. These are treacherous places to venture upon, as the action of the air and the wasting influence of the salt

sea, are constantly at work upon the frozen masses, and they become undermined and eaten away along the edges as they drift southwards towards the warmer water flowing north from the Gulf Stream, which seems to find a limit to its force about this latitude. Spreading out like a fan, it interdigitates with colder surface currents which flow ice-laden from the north-east. The drift also has its effect on the floating ice, driving it with sudden force, and grinding each block against its immediate neighbour; then the brittle floor soon gets crushed and shattered in every direction. The newly-exposed fracture glints in the sunlight with all the iridescence of an opal—delicate greens and pure blues reflect the light in brilliant prismatic hues. The sparkling water beneath throws off these refracted colours, and the pure snow above serves as a foil to the diamond-like coruscations. Every moment some new charm is added to the splendour of the prospect, and were it not from a sense of danger it is almost impossible to shake off, the spectator might spend many an hour in unsatisfied contemplation of a scene so novel and suggestive. Here is a block of ice eaten away by the rapid thawing process of the higher temperature in which it floats, until it assumes the form of the knarled stem and riven roots of some old forest tree overturned by a storm; there is the finely-

56815

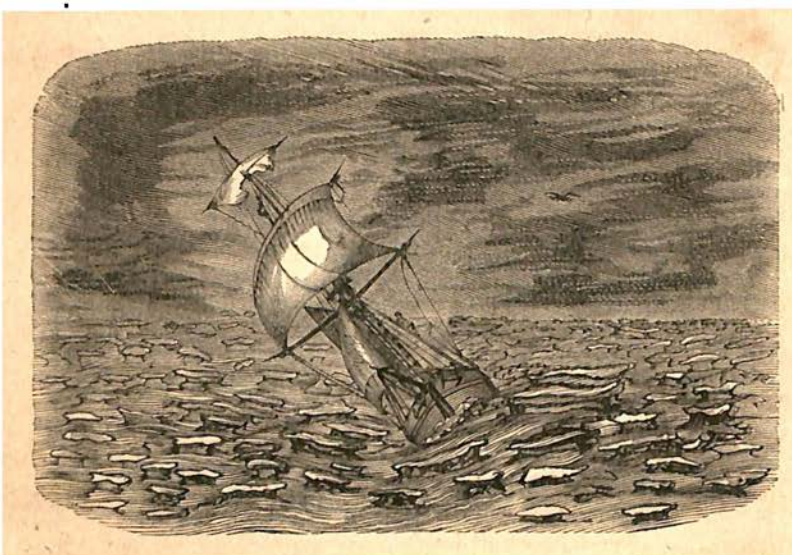
curved neck of a haughty swan carved in the purest crystal. Often whilst we gaze the neatly poised floating object we are watching will plunge head foremost into the waves, and what was but recently its submerged portion will float above the sea, the centre of gravity having become altered by the melting of the ice of which it is composed. Then the attention is roused by a report as of the firing of the heaviest ordnance, and the awful din is caused by the sudden rending of some vast frozen drift. The lurid light known by the sailors as the ice blink played over all.

> "Quod simul ac primum sub divo splendor Aquai
> Ponitur: extemplo, cœlo stellante, serena
> Sidera respondent in Aqua radiantia mundi.
> Jamne vides igitur, quam parvo tempore imago
> Ætheris ex oris ad terrarum accidat oras."
>
> *Lucret.* lib. iv. 215.

This novel episode was a fresh illustration of the altered condition of the aspect of nature viewed under the Arctic circle. It is quite impossible for any one who has not seen the ice in these regions to form any adequate idea of its wonderful appearance. The surge of the heavy sea is breaking upon the outer edge of the huge floating masses of ice, and the distant prospect is laden with heavy looking blocks, interspersed with flatter snow, covering all the fields on which little

hummocks of ice have formed. The first impression naturally is that the barrier is impassable for a ship, and this depressing effect is hardly relieved by the wonderfully beautiful appearance of the obstacle. Here the opposition is seemingly constructed out of a multitude of gigantic gems glittering in all the splendour of the diamond, emerald, and sapphire. The great waves of the sea strike against the glistening diadem, and as the spray dashes down its surface, the sun's rays catch up all the prismatic hues of the frozen facets, and so reflect them with redoubled lustre. Nor is the mind contented with the contemplation of these vast riches of rubies and opals. There are fantastic forms floating over the surrounding sea which have an interest of their own nearly equal to the lustre of the ice itself—we mean the air and water-worn portions of the ice, which, in their dissolution, grow into the resemblance of quaint forms, but the constant wasting of these objects is very striking; their destruction is rapid, owing to their evaporation from the causes mentioned; and not only is the sense of sight affected by the prospect, the ear is tortured by the thundering sound of the disrupted masses as they tilt against each other and are rent asunder. All this time we are sailing towards the densest part through a fringe of broken ice in a heaving sea. The

older hands on board now offer their opinion as to what is best to be done. We hope to find streams of water leading to the westward, and we make the attempt. There was a long neck of ice about two miles broad, the sea breaking on the outer edge, the swell lifting the inner pieces and threatening to grind the whole mass into powder. Into this commotion, the



schooner is forced with all speed, charging the most likely place to make an entrance for us, as the surge rises and falls with awful fury. Thump she drives against the barrier, the bells ring out loudly on board, the glasses rattle, and the schooner shivers from stem to stern. The nerves of the uninitiated quiver the while, but we force our way, and, once inside, we take the ice

obstacles with greater care, backing off, filling again, heaving about, twisting this way and that, and by the help of ropes and poles, turning the schooner whenever the ice ahead is too thick to contend with. When once a wall of ice is formed by the combination of a number of pieces getting packed closely together, it entirely breaks the swell of the sea, and leaves the water perfectly calm within. Another remarkable effect we now noticed for the first time, although we had read of it in Arctic records, was the curious effect of the ice upon the wind, even though a gale may be blowing. At a short distance from the outside edge the force of the wind is stayed, and its influence is no longer felt. We now felt sure some accident must occur. Several of the ice fields were an acre in extent, and as they float above the surface, their thickness can easily be calculated, for we only see one-tenth of the submerged mass above the sea. A block of ice of twelve feet elevation presents its front to the approaching ship. We must ever bear in mind that this twelve feet represents a thickness of one hundred and eight feet below the surface. Great and irresistible as this obstacle may appear, it is easily dealt with. The united efforts of two intelligent men soon divert its threatening course; but men experienced in dealing with ice should alone attempt to cope with difficulties

such as these. To drive a ship through such waters as these would be sure to end in disaster, if attempted by sailors who had not been reared in this kind of service. We noticed that the blows were delivered upon the angles and corners of the ice rather than upon the surface directly. Should the vessel strike against ice aground, of course the shock is as great as if a rock was ahead. We got through the first long neck of ice into clear water, only to commence another attack. By this time we are grown well acquainted with the details of the operation, and we drive headlong into another pack. The fog now grows so dense, we are quite unable to advance. Fortunately for us, the calm here was perfect, and the swell of the sea had quite subsided. Gradually the wind rises, and there being no prospect of any further progress in our intended direction, we turn the schooner's head towards the south, and a lane of water having in the meantime opened in the direction we were about to sail, we took advantage of it, and the schooner stood out towards the open sea once more, the walls of ice on either hand protecting us as we went.

Early on the 6th, our second harpooner went away in the whale-boats, and soon returned with our first seal; in the mean time, we amused ourselves by making short excursions from the schooner in quest of loom

(*Uria grylle*), and other sea-birds. Fine as the weather is, we are forced to keep the ship in sight, owing to the foggy state of the atmosphere; presently a second boat's crew ventures away, and we observe a signal from the deck intended for us, which indicates something is in store—a seal has been noticed from the deck floating at some little distance, and we stealthily go in pursuit of the pussy (the seamen's name for a seal); we kneel down in the bows, while a sailor in the stern sculls warily towards her, stopping whenever he sees the least motion in the ever-watchful animal. She is resting on the ice, and as we approach, she lifts her head and turns slowly to look upon us, when, of course, we remain perfectly still until she again settles quietly down. In this way we advance to within about thirty yards, when she turns restlessly, as if contemplating a sudden move; we see her keen, inquiring eye turned full upon us—a warning word whispered by the sailor, and as we pull the trigger, the whisper is changed into a wild exclamation of disappointment, for the seal slips quietly over the ledge out of sight; we feeling perfectly satisfied with the success of the shot, hurry up, and entirely forgetting the advice of the Hull Harbour-master, jump on to the treacherous ice and hasten to the opposite side; there the ledge overhangs somewhat; the mass yields beneath our weight, and

we are precipitated head-foremost into the water. Recovering from our momentary sensation of surprise and bewilderment, we look about for the seal. There she lies, however, dead upon a tongue of ice, and just beneath the surface; but for this platform beneath the waves, which is a rather common shape assumed by floating ice, it would have been a difficult matter to save one's self from drowning, owing to the heavy weight of our fishing-boots and thick clothing. As it is no worse, we grasp the flipper of our dead seal, and with no small difficulty she is stowed away on board the boat, and we slowly follow. A good pull back to the ship to keep up the circulation, and a change of dry clothing, terminates our first lesson upon Arctic ice—a lesson not easily forgotten; lat. 71° 29′ N., long. 9° 29′ W., temperature of water 31°, of air 32°.

The ice continues to head us since the 7th, and we determine to sail north. Here we obtain our first midnight observation of the sun, and find the altitude 6° 30′, lat. 73·12. Up to this point we have been endeavouring to accustom ourselves to the want of darkness, and we now begin to enjoy its absence.

The loom (*Colymbus septentrionalis*) being a fast swimmer and active diver, affords us some sport during the necessarily slow progress of our voyage. He requires to be hard hit, as the feathers are so

TREACHEROUS ICE.

Page 108.

thick and closely packed they seem to us to throw off the shot. His beautifully white breast and glossy black plumage greatly interested us, but for lack of the requisite materials for preserving the skins, we were unable to bring back specimens. The sailors enjoyed the flesh of these birds, but our cook did not give us the opportunity of testing its gastronomic qualifications. At 6 P.M. the fog lifted, and we had a fine view of Mount Beerenberg, bearing S.W. ½ S., at a distance of about eighty miles; the wind was from south-west, and the weather fine. Running with a light breeze along the edge of the floe in the fog on the 8th of June, the ice itself trending towards the north-east, we find ourselves suddenly surrounded by a large shoal of seals; they, too, are racing north, and, as they go, they turn inquisitive looks upon us, and then dash off into the wildest games ever contemplated by boys suddenly released from school, plunging head foremost into the waves; the young and old together rearing themselves half out of the water in their mad gambols, whilst a man seated aloft in the "crow's-nest" keeps constant watch upon their movements, in the hope that the herds, growing weary of play, will betake themselves to the snow-covered ice, where they seem to enjoy the warm rays of the sun, as they roll over and over, and

gradually subside into a restless sleep, disturbed by the thought of hungry bears, ever on the watch for food, or the still more merciless seal-fisher, their more deadly foe. Now a small family party are seen to approach the ice, and after some preliminary investigations, they proceed to land. In a few minutes they are evidently in full enjoyment of their temporary rest; they lie stretched in the sun. A boat is lowered with great circumspection, and after a time the rapid report of fire-arms tells plainly that the seal-hunting has commenced in earnest—the fog is too heavy to enable us to see with what result; but the other boats are soon ready, and, taking with us a compass to find the bearings of the ship, which is only seen occasionally as the fog lifts for a moment, we push off in the direction of the firing party. A bullet whizzes over our heads in dangerous proximity as we pull up, warning us that the sport is not without its dangers. All is excitement now, and we sit prepared for action. There! the great head of a seal rises above the water close to the boat. We fire, and miss what might seem an easy chance; but the motion of the boat, always uncertain, renders the shooting of one not expert by practice, anything but reliable. Now the boat is surrounded with the seals, all eagerly gazing at the hunter, but

the hunter is not prepared, and before he is ready for their reception, they have vanished out of sight, like the spectre forms seen in some troubled dream.

These seals rise to the surface of the water unexpectedly, without making the slightest ripple, or so quietly that they seem to appear by magic; and when frightened they sink out of sight in the same imperceptible fashion, without warning of any kind. Slowly and gradually they sink, in the most tiresome and tantalising manner, while you are trying to fix the sights of your rifle in the very unsteady boat. The thought that they must be hit fair in the head is an additional reason for being nervous; in our opinion it is the most difficult description of shooting a sportsman can have.

The steersman detects four fine beasts upon a block of floating ice, in the distance. The crew give way with a will, and as the boat comes just within the desired range, and we are about to single out the largest among them, they suddenly disappear, diving over the edge of the floe with a graceful ease, to see which almost repays one's disappointment and chagrin.

Later on in the day the anxiety to shoot, often caused the crew to be utterly careless in their management of the fire-arms and ammunition entrusted to

them. On one occasion we were fortunately in time to prevent actual mischief being done. A fellow armed with a rifle caught sight of a seal between us and another boat, at some little distance from us. He was about to fire at the seal, and in the direction of the boat, when the bullet might have passed between two of the crew on board; we were just in time to throw up his arm at the very moment he was about to pull the trigger. The man declared his object was to avoid injuring his friends, as the bullet would have passed between them!! It was impossible to argue with so keen a sportsman. Forcible measures were the only means of securing proper caution in order to avoid some fatal accident.

We have witnessed on many previous occasions the same reckless disregard to common prudence on the part of our sailors; but strange to say we have no recollection of any disaster happening to themselves or the bystanders.

Looking round we find ourselves in close proximity to the other boats, and hasten to inquire what sort of sport they have had. For old hands the result was poor: one crew had bagged three, the other seven seals.

Leaving the boat and landing on the ice at a point close by, we cautiously advance, creeping over the

snow towards some hummocks, for beyond them a small batch of seals are seen basking in the sun. We take steady aim, and a large seal falls to our gun. A second shot seems to add speed to the flight of another beast close by, and as he in mad haste tries to reach the water, he receives three bullets in his tough hide, all to no effect. The seal, unless struck in some vital place—the head, or behind the flipper at a point directly over the heart, seems indifferent to the shock of a bullet; his great shapeless form covered with thick layers of fat offers no other definite or decided mark for the sportsman, if the head or heart are missed. Preparations are quickly made for "flencing" our seal, but the body is lying on a detached piece of ice which must be reached by using a smaller block as a raft to float us over. We are now more cautious on the ice than on the previous occasion, and a haakpick is a valuable aid in testing the qualities of the floor beneath us. The seal is turned on its back, and a long cut is made from the head to its tail, a cut round each flipper, and a few more to detach the blubber from the "krang," then the operation of flensing is soon completed. This operation, owing to the temperature of the air in these high latitudes, is a most sickening sight to contemplate, as the quivering flesh seems still to be

endued with life for some minutes after death; and in the early months when the sailors find the weather bitterly cold, the men put their hands into the still warm bodies of the newly killed seals, where the animal heat is retained for a considerable period after death. A rope is now attached to the hide, which is thickly coated with blubber, and the heavy mass (worth from £35 to £40 per ton) is about to be dragged towards the boat, when, to our confusion, we find ourselves drifting slowly but surely away. Our boat rests moored to the piece we had fastened it to at a considerable distance off, and quite indistinguishable in the heavy fog. What is to be done? The sailors, according to their invariable custom, begin to recall precedents which all, unfortunately, have a fatal termination. One horrible story after another is told. "You remember them 'ere chaps as was left in this here way and was all froze to death?" "As for that ship *Enterprise*, I assure you, sir," says Magnus, "we could speak to the men on the ice, but could not get at them! blowing a gale and freezing hard at the time! thermometer 40 degrees below zero! We did all we could: the oars and foremasts were tied together to try and reach them by means of a raft, when they disappeared in the fog, lost to sight though not to memory, and they all perished!" Matters every

moment grow worse, so without further delay we divest ourself of our heavy boots, examine the edge of the ice for a good take off, and with a run and a jump, which seemed almost impossible, we just catch the edge of another island of ice, and though we wet our feet in the attempt, are thankful for our success. Wet feet up here is a matter of serious consequence, however. Our difficulty is now overcome, and after some hard tugging we haul our boat alongside, stow away our prize, and make for the next batch of floating seals. We gain experience as we go; we find that a single seal resting upon the ice is far easier to approach than a small herd, for the party, no matter how small, seems to appoint one of their number as a watcher, whose nervous trepidation in his position of responsibility always communicates itself to his companions, and the possibility of approaching near enough for our purpose is reduced to the smallest odds.

We did not leave off the pursuit until the boat began to settle rather low down in the water, owing to a heavy cargo of blubber attached to the skins of the seals we had killed.

Eight hours of seal-hunting is fatiguing work for the keenest sportsman, and although we return to our ship in broad daylight, we turn in for a few hours'

rest with the same feeling of want of repose as though night and proper roosting-time had arrived. After four hours of retirement, although unaccompanied with sleep, we find ourselves ready to renew the contest, and, organizing three separate parties, leave the ship with a new plan which we hope may succeed; our object on this occasion being, if possible, after having spread ourselves some distance apart, to close in from all sides, and so surround the seals at some common centre. Our plan, clever as it seemed, did not succeed; the seals were more wary then ever, and demanded all our skill both for tracking them, and, when found, to account for those fired at; evidently the difficulty of shooting from a boat in a rough sea can be overcome by practice, and by practice alone. As the time wore on we knocked over a seal that had already been wounded by a bullet from some other ship. One would think a rifle bullet lodged in the back would be a source of inconvenience to the wearer, but there was nothing to indicate that he had suffered in the least from the leaden deposit.

One poor seal to-day interested us greatly in his fate, though our desire to capture him at all hazards did not overcome our pity, for in his plight he happened to be close to the edge of the ice as we ap-

proached, and after a steady gaze he dived with the evident intention of getting clear away. Not so, however; the place where he dived was very shallow, owing to a long tongue of ice stretching out at a little distance beneath the surface, and each dive the poor wretch made only brought him nearer to us. His evident confusion only made matters worse, and as he rose each time he glared at us with baffled rage, and growled aloud meaningly in his perplexity, his whole aspect giving us the idea that he knew his impending fate, for he rushed madly towards us, when we, always ready with the haak-pick, secured him by a well-directed blow on the head. All this time the fog is steadily closing round us, creeping up with the wind from the far horizon. In order to discover our whereabouts we fire a gun from time to time, and the signal in reply comes sounding over the ice; without further delay, the oars force the boat through the ice cold water, and as we give way with all our might, after a three hours' pull, during which time we have to clear the many islets of ice which intercept our course, a clear space in the surrounding gloom, owing to the fog lifting, gives us a momentary view of the ship looming towards us in the distance, and thanks to this opportunity we are saved a weary search for the long wished-for deck. The game being counted gave a

return of forty seals, about a third of the number we might have fairly reckoned upon had the shooting been good; to us, however, the bag seemed a heavy one, everything considered.

Our zeal in the pursuit of these animals having in no wise abated, we vary the performance by steering the schooner along the ice edge, the sportsman with his gun keeping a sharp look-out for game, particular attention being bestowed on each long-point end, as the promontories of the streams of ice are called, for at these points the hunted seals are always likely to make a short stand on their ever onward course towards the north and towards the depths of the pack-ice, where they would hope to obtain some respite from their pursuers. Where that northern point may be towards which the west-ice or saddle-back seals (*Phoca Grœnlandica*) are making, has hitherto been a puzzle to the seal fishermen; that they rest in some remote northern latitude there can be little doubt, as they are found in the early season far south on the breeding grounds, where very young seals are found on the first coming of the fishermen, and at that season the gravid seals and their young of the year fall an easy prey to the seal-fishers whenever they are fortunate enough to find their way to their breeding haunts. But as the season

advances, they return to their northern homes, and escape further pursuit for that year.

Speculating upon the migratory habits of the seal, we come suddenly upon a small family, probably, from their extreme wariness, a batch we had been in pursuit of the previous day; their heads are continually raised, and as the day is damp, and has the same effect upon seals as damp weather always has upon wild game of every kind, we find it almost impossible to get within range; we endeavour to stalk them, a matter of exceeding difficulty, owing to the inveterate habit of sailors to chatter and fidget whenever occasion demands perfect silence being preserved. We notice that the least rustle in the boat disturbs the game, we take off our boots, the oars are taken in, and one man, having an eye upon the herd, sculls the boat, always taking care to stop the same instant he notices that he is being observed. We try Hawker's dodge of burning a turf in the bows, and advance under cover of the smoke; in spite of every precaution we are forced to return on board, with only two seals accounted for.

The look-out man now declares he has seen clear water in the far distance, and the man on deck, guided by his directions, struggles through the streams running south, the good little vessel behaving admirably as we make our way towards the east. Our object is to

round the point end of the ice, and so stand away again to the north.

The fog on the following day hung like a pall round the ship, lifting occasionally its vapory fringe and letting us see in the clear spaces around such easy chances for obtaining sport with the seal, that we are all impatience to be gone in their pursnit, but the harpooneers, grown cautious by long experience, are strangely averse to any such proceedings in the present condition of the atmosphere. They tell of former misadventures and narrow escapes, which happened to themselves, enough to fill the stoutest heart with apprehension. One of these poor fellows was actually lost by his ship, and when almost on the point of giving up in sheer despair, he was picked up by another whaling vessel, and so got safe out of a danger which otherwise might have terminated fatally. Two boats' crews belonging to a captain who still sails in these seas were left to such a horrible fate as falls to the lot of those left behind, no haven for them but death, through their utter inability to find their ship again ; they were lured away by some such tempting chance as now offered of procuring a seal or two. Towards the afternoon the curtain lifted and the sun shone out; all semblance of danger being now removed, we get out the dingy, an unsteady little

boat worked by one man, and we shove off in the direction of a point of ice where two great seals are basking in the warm rays of the sun. We creep steadily towards them, dodging past the blocks of floating ice as we go. Our two guns are ready, and we agree to fire at the same moment. Nothing seems more certain than that the precautions we have taken will meet with the success our efforts deserve, but we are again doomed to disappointment; we only wound the largest. These seals we made so sure of were what are called bladder noses (*Cystophora cristata*). These strange-looking fellows are quite unlike in facial aspect to any we had previously seen.

The bladder-nose is the fifth variety of seal we have as yet encountered, and from his habit of going farther on the ice, and making a greater show of resistance to his pursuers, he promises to afford greater opportunities for sport.

Hardly had we time to load, when they appeared again close by the boat; disturbed in their nap by our sudden onslaught, evidently they had dived to avoid the threatened danger, and were now on the surface to reconnoitre—perhaps each feared for the safety of the other. There was no time to lose, therefore, and a bullet was lodged in the tough hide of the male. Down he plunged once more, but evidently hard hit. We

prepare to harpoon him if he offers us the chance, but being too far off for this attempt, we wound him again, and again he disappears. The sailor gives way with a will, and on his again presenting himself we lunged at him with the harpoon. Owing to some awkwardness the head became detached, and he was struck with the harpoon staff instead; seizing the staff in his formidable jaws, he smashed it in half. We hasten to adjust another harpoon, and are determined not to fail should he appear once more. We stand waiting impatiently for him; as his great head appears over the water he stares wildly at us, and it is impossible to imagine a more ugly looking brute. The nose is puffed out, his teeth showing, his eyes glaring on us, blood streams down his forehead and over his cat-like whiskers, as he disputes with us every inch of the way. He comes steadily down upon us, but we are equally resolute, and this time the harpoon is driven home with all our force; and it passes right through the clumsy body of the seal. Of the six bullets fired at him, two we found had actually grazed his skull, and these wounds did not certainly add to his beauty. Dragging his great and unwieldy body on to the ice, we flenced him, and soon had the hide on board our boat—the skin spread like a mat beneath our feet. We turned towards

another tempting shot, and not to weary our reader with recitals of scenes which to the seal hunter are full of exciting incidents, we record our subsequent successes that day with the tale of four other captures, and conclude our day's work by a long evening's sport amongst a little colony as we go sailing steadily along. We saw in the distance one little party far in on the ice, a habit the bladder-nose seal indulges in, perhaps relying on his greater size and the security he feels in being under the protecting influence of some patriarchal fellow who shows marks of his prowess in former conflicts. So, at least, it might be inferred on this occasion, for one of the largest seals we had yet seen lay surrounded with a family of five of his fellows. As we can easily sail the schooner within range, the steersman is instructed to use all his skill in approaching them, while we distribute rifles amongst the eager crew. Twelve men crouch down along the gunwale of the schooner, breathing quickly with impatient expectation; no other sound disturbs the victims as we rapidly approach within gunshot range. An occasional lifting of the heads and uneasy glance to the right and left indicates that the watchful leader is fearful of some impending danger, and presently the others participate in his apprehensions. We are close enough to risk a shot, when one of the seals, more nervous than the rest,

begins to waddle towards the edge. He has nearly gained the water, when the quick word is given to fire, and a volley, well directed, knocks over all but one. This one seems to bear a charmed life, for he rallies through the crowd of prostrate companions, in a hail of bullets, without receiving a single wound, and while all on board are madly intent upon the chase, no one, not even the steersman, heeds the position of the ship, now in such close proximity to the ice, and before the danger can be averted, our schooner bears down upon the point-end and the jibboom bends like a bow as it comes full-tilt against the hummock of ice which lately afforded a resting-place to the seals. The loud barking of the dog, with the wild shout the sailors raised to "blaze 'em," as they say, in order to bewilder the escaping seal, was rapidly hushed, and the dead silence which ensued was only broken by the falling of the head-gear which came tumbling down in consequence of the shock. There lay the seals on the ice abeam of us, the old and savage bladder-nose, the leader of the family, glaring grimly at us, the loose skin over his nose distended to the utmost, giving him a hideous appearance; his whole aspect full of threatening should we dare to approach. Every thought is now turned to the safety of the ship, and it is not until after proper order is restored on board, that the

men proceed to fience and bring in their valuable booty.

The cold northern wind at length arrives and the ice begins to slack off perceptibly; up to this time it had been twisting about in a curious way, although seemingly jammed closely and compactly together. The motion is now more clearly defined—now it threatens us with a squeeze, but we manage to give the mass a different direction, pushing it on one side, and compelling it to vent its force upon its icy neighbour. We get the warps and ice anchors out, make sail, and with a boat all ready to take the men from hummock to hummock, we commence the arduous task of "boring out." After a few hours we get into a stream running to the southward, the ice also slacking off, and also trending in the same direction.

The 11th of June we speed on our way, keeping a sharp look out for the point ends as we coast; the ice yields but little game, one seal only falling to our gun, and we pushed on some forty miles to the northwards without any further gain worthy of notice. There we saw a steamer far in the pack, and near her the ice is covered with seals; thousands and thousands of these animals recline upon the ice in long lines, and every block of ice in sight appeared quite blackened by the numbers upon them. These

were the mothers with their young on their northward passage—interspersed amongst them were a few bladder noses. This steamer can force herself in amongst the ice without much risk or difficulty. With our schooner it would be impossible to attempt so much, and our boats are unable to force their way after seals, yet we lose no chance that may present itself of following up the sport. While we loiter here in doubt respecting the course to be pursued, the question is finally settled by the appearance of two fresh arrivals on the scene; two steamers come puffing and screaming towards us, following their system of joining in the sport whenever they find any indication of the presence of seal hunters, who, though lacking some of the advantages of the steamer, have far greater opportunities of sport, being less noisy and demonstrative than they necessarily are in their progress under steam. There is now nothing for it, but to stand away far to the north of the new comers, and to wait for the arrival of the seals which are sure to be driven in our direction by the steamers to the southward of us.

The men say that after the month of August no seals are to be found on the west ice so far to the south, and we begin again to speculate upon their northernmost haunts.

CHAPTER III.

"So on we journey'd through the evening air,
Gazing intent far onward as our eyes
With level view could stretch against the bright
Vespertine ray: and lo! by slow degrees
Gathering, a fog made toward us, dark as night
There was no room for 'scaping; and that mist
Bereft us both of sight and the pure air."—*Caley's* DANTE.

STEAM-VESSELS intended for the ice require to be not only of a very strong construction but of a peculiar model. It is essentially necessary that a vessel frequenting the Arctic seas should be full-rigged, and sailed, in case of a break-down of the engines, or the running short of coal; when the vessel would be in a safe condition to prosecute her voyage. The construction of a ship for this purpose is also novel when compared with others. The sharp run and clean entrance into the water of a steamship has to be kept in view, as well as the peculiar breadth of beam necessary to all sailing craft to give her hold in the water, but something must be given up to ensure both sailing and steaming qualities; everything depends upon a judicious economy of steam propelling power with a small consumption of coal, so that it may last with

care the whole of a voyage, where there are no places to replenish. Consequently, the necessary beam for sailing purposes should be retained with a moderate sharp bow, but the stowage of cargo in the hold has to give way; the flat floor is changed to a sharp, wedge-shaped bottom, which answers all the purposes of clean entry and fine run, the room for stowage of cargo being given up. Were some of our men-of-war, of what is called the composite-class, built after the fashion of whaling-ships, we might have the two qualities combined. Whereas, the long bows, rising three feet above the level of the afterpart, with thin, narrow ways in wake of the foremast, give them no hold in the water, and when on a wind they are useless; nor can they beat off a lee shore, even in a light breeze with little sea. To be able to run up in the wind's eye and go about without loss of way is an essential quality in weathering a long tongue of ice. The engines require to be made on the compound principle, and no expense should be spared to ensure their perfect structure. It often happens that, when under sail, the two square sails on fore and mizen mast have often to be hove back, to save the vessel's bows from striking the large pieces of ice when navigating the narrow channels.

These steamships are specially built for the Arctic seas. They are fast, and easily handled, consume a

very small quantity of coal per diem, and carry in anticipation of a cargo of oil, a store of coal in the oil tanks. Such vessels are necessarily costly, being constructed to steam and sail whenever the occasion may demand it. Owners of steam-vessels or of sailing crafts suffer from want of some such combinations; and although on some voyages such vessels make a lucrative venture, there is no question about the greater value of a sailing-steamer in these Arctic seas, adapted as well for one purpose as the other.

Ordinary masses of ice offer no opposition to the whaler under steam, and beyond the shock to the system of the sailor, who is not ready when the look-out man calls out, "Hold fast!" there is rarely any perceptible injury done to the craft itself.

Hurrying towards the north, we overhaul two more Peterhead steamers, and early on the 12th a Norwegian brig hove in sight. Her beams would serve for the timbers of an old line of battle ship. She is put together so stoutly that we cannot but admire her bows, iron-bound, and having great sheets of iron overlaying her on either hand. She was clean—*i.e.* empty—and her captain was the true type of a Norwegian, tall and handsome; and though his features were bronzed by exposure to the Arctic atmosphere, which has the same effect upon the skin as the

very warmest air of the Tropics, to judge by his blue eyes and light hair, his skin ought to have been fair. He had a crew of fifty-five men, who were paid on the "share in the profits" principle; and as they had been away from home since early in April, without capturing a seal or whale, the poor fellows had but a poor prospect for the coming winter at home. The Norwegian was as hospitable as his race is known to be, and did the honours of his cabin with true courtesy. As we entered this curiously quaint room, we noticed that his table presented the appearance as if some scientific game was being played by the skipper to while away his solitary hours when his presence was not required on deck for the sailing of his ship. An infinity of little holes dotted the surface of the board, and a few pegs stood out here and there, with something like order in their arrangement. We apologised forthwith for our intrusion, and the consequent interruption in a game we were unacquainted with. Judge then of our surprise when we learned that the pegs and holes were the ordinary means by which the crews on board such ships keep their plates and glasses during dinner in their places when the weather is at all rough.

He was glad to pick up the threads of European political affairs since he left home, and the "Alabama Question" particularly interested him. He was very

anxious to learn if we had "commenced to give Jonathan his deserts?"

Standing again away to the north, we were on the 13th of June once again in the midst of our friends the seals; but as there was a brisk gale blowing we all stood on our course together, without a thought of the "point ends," as this kind of weather offered no inducement for even a temporary halt, and we consoled ourselves with the reflection that the first fine warm day will tempt them to rest themselves on the ice again. Next day two herds of narwhale, going north, also came in sight, and shortly after a chance of picking up a white whale presented itself, but it came to nothing. These whales were going towards the east. We content ourselves with an examination of the ships in sight, as we have letters for the *Eclipse*, and are anxious to fall in with her captain.

We learned from the *Flora* the news of the ill-success of the fleet up among the north-west ice for the season, and beyond one luckier than the rest, who had three whales, sport had been very bad. The *Flora* had not, owing to her being in the hands of German owners, gone out the previous season, for fear of the French cruisers.

We had but small returns of sport up to the 20th, when we entered upon a scene of difficulty and some

danger. We were steering amongst very heavy lumps of ice, and the cry of "Steady!" "About ship!" "Port!" "Starboard!" &c., gave work without a moment's cessation to every man on board; our craft worked to admiration, but received a bump now and again, which it would have been impossible to avoid. The look-out man, aloft in the "crow's-nest," reported clear water (water between the loose pack and the fast ice) to the far north, and our hopes rose at the prospect of sailing in one of these deep bays, between the northern and the southern floe, that had been broken off in the early spring; but our hopes are soon dashed by the information that the water is enclosed in ice, and that it is what the whalers call a lake, or hole, a vast space surrounded by ice, where the water within is in perpetual calm. In an interval when our main opponent, *the fog*, lifted from the surface, and disclosed the whole scene, we discovered that the ice forming the northern shore of the lake was perfectly smooth, and there were indications, besides, that game abounded in that direction. No time is lost in getting ready a hunting party, and we go in quest of the seals we had seen through the misty air; but who shall describe our disappointment, after climbing over and crossing a high hummock, on finding the ice floe incapable of bearing our weight? We made the attempt,

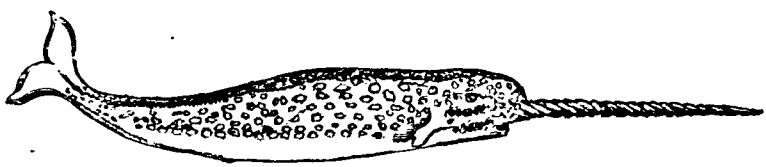
however, but after blundering for a while in the slush and snow, we turned back, defeated, and made other and equally fruitless attempts in every direction where there seemed a possibility of success. Baffled in our efforts, we were about returning, when an unexpected occurrence arrested our progress. A novel interruption, a whirl under the surface of the water, and the boat suddenly slewing round, caused us all to start up in consternation. What could be the cause? Looking over the side, we see a large Narwhal rising to the surface, his splendid horn and curiously dappled hide being distinctly visible. He presents a capital opportunity for a successful shot; but, as often happens in such circumstances, we are not ready either with gun or harpoon, and as he has seen his danger, he has dived out of reach, and we are forced to return on board without a capture. The hole we are in evidently closes around us, and we make desperate efforts to escape from being caught in the ice. Already we have struck several pieces and received some severe thumps, even a bit of our false keel, being broken off, came up to warn us of our danger; and now we have hardly room to turn round. These disappointments and disasters fill the most experienced amongst us with forebodings of evil, and we find ourselves falling in with his opinion. We

strive all we can to make the best of it, and secure our vessel to a bit of ice, whose two projecting tongues keep off the pressure for the present.

Nature now wears an aspect, "such as the painter might imagine, or the poet, with his lying licence, might invent, or the imagination of a sleeper could fancy in dreams of night." It is our first experience of being "beset in the ice," we go into our cabin with the vague impression that at any moment we may be crushed to death; and before going to sleep, we note that the thermometer is very low; that the water is perfectly calm outside; there is a stiff breeze blowing from the south—everything indicates a gale beyond the ice—but at this distance from the unfrozen open water, the wind is moderated by the wonderful effect of the icefields on the atmosphere above, the moist particles borne along by the gale become condensed as they float over the ice from its edge, and the barometer is depressed accordingly, clearly showing the disturbed state of the atmosphere outside. The storm of wind is mellowed with us into a gentle breeze by the same agency, and it is quite possible that the wind at a little distance in the opposite direction is blowing steadily from the north, and possibly along the edge of the ice to the southward, and hence it may be only local

in its effects, and need not be dreaded. It strikes us that this question of local storms and their formation is a question of supreme value in these seas, and the study of the barometer is of paramount importance. At present the instrument is almost ignored by the sailors in these Arctic seas, simply because its use is not clearly understood. Sufficient attention is not paid to the changes of the currents and the position of the ship with respect to the ice, and the direction of the wind in connection with the fall of the barometer. In a fine season like this we were enjoying, it was simply impossible to make observations of this nature, but in heavy weather no opportunity should, in our opinion, be lost of collecting such data as we have indicated here. In the morning the ice had closed in around us, leaving about 200 yards of clear water, and close by a larger lake was seen in which the narwhals could be heard blowing. We lower a boat and let her "lie on bran," as they call a boat ready for action at a moment's notice. In this service the men are relieved every two hours. We sat in the boat at our oar with the rest, ready to take our share in whatever work is cut out for us. We are in momentary expectation of seeing the narwhal in the open space around us as we sit silently watching; we hear them blow, and can see in the distance the little jets of

vapour spirting from the curious blowholes placed on either side of the head above the curiously formed eyes. We sit and listen to this dreary overture, waiting for the performers to come within our reach, but are doomed to wait nearly two hours before any sign is made. Then the longed-for signal is given from the taffrail of our schooner, intimating that something is seen astern. The signals being made in a kind of suppressed dumb show are so grotesque, that we almost spoil our chance of being successful in the coming struggle by giving way to the laughter we



can hardly suppress; the object of the signalman evidently being to assure us that there is no deception this time.

The narwhal is the most difficult of Arctic game to deal with; he never remains at rest for any great length of time, and is generally seen at the surface of the water halting for a few minutes to breathe, or going at great speed. The utmost caution is therefore requisite in approaching him; the oars are carefully dipped in the water, the strength of the stroke is diminished in order to lift the oar out again without

noise or splash. Only a few strokes, and the boat has "way on" sufficient to take her within harpoon range; the harpooner raises his hand, the signal is repeated by the steersman, and the men rest on their oars; the force given to the boat's motion proves sufficient to bring us alongside. No one dares to turn his head, and we feel the short interval of enforced obedience to this severe trial of patience intensely. The narwhal all this time has not budged an inch, he does not even seem to notice us; his eye, however, is so placed that he has a wide range of vision, and the steersman, knowing this, takes us obliquely towards him, being careful to keep at a respectful distance from his tail. The boat glides within striking range. What would we not give to see the action of the harpooner now! But while we hesitate, a wild hurrah comes from the ship, and the spell is broken; we look round in time to see the line fly like lightning from the tubs. "A fall! a fall!" is the cry of the boatmen. "And well fast," is the echo to the cry. A second crew hastily man another boat and hurry to our assistance; the stricken narwhal has taken a headlong dive beneath the ice, so there is nothing for it but to take the line over and across the pond we are in, and with two or three long and strong pulls we drag him to the surface. Up comes our narwhal, lashing the water with his power-

ful tail; we drive our long lances into his spotted side, and for ten minutes we keep up the unequal contest. After a final plunge and dying struggle he is our own; a rope is rove round his tail, and all hands together drag him on to the ice. We measure him, and find him a good eighteen feet. In a short time his blubber is cut up into pieces sufficiently small to go through the opening in the casks, and the whole is carefully stowed away, as the oil is of the finest quality. His horn, after a rough polishing up, is taken down with some ceremony and deposited in the state cabin, a trophy of the great deep. Then our men get together to make a vast fire-place out of his remains. This is a scientific operation, and is done with due care. The framework of the carcase is rolled over, and turned with its back towards the wind; the interior is cleared out, and a hole is made somewhere in the back, destined to serve as a chimney. The openings between the ribs are made to serve the purpose of a grate, to let the air in below. Plenty of wood and oakum is packed inside, a match is set to the materials and he burns brightly. The greasy, oily flame is highly inflammable, and the mass soon frizzles up into a stinking cloud, the object being to attract any bears that may be straying in the neighbourhood, the olfactories of the great polar bear being, it is supposed, unable to resist

the tempting odour. He hurries to the scene in hot haste—at least they have been known to come a distance of twenty miles, attracted by burning animal matter. We, however, could tempt no bear, and concluded there could be none within our range at that time.

It has been noticed that the female *Monodon monoceros* is more spotted than the male; the young is much darker; some individuals are almost white, and we killed one destitute of any projecting tooth. Its food consists, it is said, of crustaceans, fish and cuttle fish. An investigation of its internal structure has satisfied the anatomists of its amphibious nature. The blow-holes are placed directly on the top of the head; they are large, semilunar, opening on either side, and leading down to the bronchia and the lungs. The female is destitute of the long horn, and has two teeth about ten inches long instead. The tooth, or teeth, of the male, for sometimes a narwhal is taken, having two teeth protruding from the jaw, is smooth and tapering, and curiously twisted in the form of a spiral drawn out to a fine point, the spiral turned towards the left; the surface of the tooth is wrinkled, and only the point during the lifetime of the animal is clean and ivory-looking, the remainder is covered with a bark of dirty matter which somewhat detracts from its beauty. The

value of this ivory is considerable, and at one time the tooth of the narwhal had some reputation as a medicine. Master Pornet, in his "Historie of Drugges," gives some curious particulars respecting its qualities, and to the present day the tooth has a high medicinal value in the Chinese pharmacopœia. In the palace of Rosenborg is a throne of the kings of Denmark manufactured of this ivory, and the father of Captain Scoresby had the posts of his state-bed constructed out of the splendid teeth of this animal. The oil we know to be of value; and Dr. R. Brown, during his recent travels in Greenland, where he has gathered the most complete materials for the history of this and other Arctic animals, states that a jelly made from the skin of the narwhal is looked upon, and justly so, as one of the prime dainties of a Greenlander. The hospitable Danish ladies resident in that country always make a point of presenting a dish of "mattak" to their foreign visitors, who soon begin to like it.

The narwhal is gregarious, generally travelling in great herds. We saw them going in flocks of many thousands, travelling north in their migrations tusk to tusk, and tail to tail, like a regiment of cavalry, so regularly do they seem to rise and sink into the water in their undulating movements as they swim. The use of the tusk has long been a matter in dis-

pute; it has been supposed by some that it stirs up its food from the bottom, but in such a case the female would be sadly at a loss for want of a similar appliance, though a recently described New Zealand bird seems just a case in point; for here we also find the male bird is furnished with a long and sharply curved beak, while the female of the same species is known to have a very much shorter bill, and there is no reason to believe that their food is different.

These narwhals are pugnacious one with another, often it happens that the tooth gets broken, and in savage encounters the point of one opponent's tooth has been found embedded in the broken piece of the other. Fabricius thought its use was to keep the holes open in the ice during the winter; and the following occurrence seems to support this view. In April 1860, a Greenlander was travelling along the ice in the vicinity of Christianshaab, and discovered one of these open spaces in the ice, which, even in the most severe winters, remain open. In this hole hundreds of narwhals and white whales were protruding their heads to breathe, no other place presenting itself for miles around. It was described to Dr. R. Brown as akin to the Arctic Black Hole of Calcutta, in the eagerness of the animals to keep at the place. Hundreds of Eskimo and Danes resorted thither with their dogs and sledges,

and while one shot the animal, another harpooned it to prevent its being pushed aside by the anxious crowd of breathers. Dozens of both narwhals and white whales were killed, but many were lost before they were got home, the ice breaking up soon after. In the summer ensuing the natives found many of the dead washed up in the bays and inlets around.

We have fine weather on the 24th, with a calm sea, and the atmosphere has a curious effect upon the scene, which is novel, and not without its meaning; the clear water in the distance seems as if it was lifted up far above the level of the ice floating on the sea. This is the result of refraction, and the harpooners notice the fact, and say it is an indication of a north or north-eastern wind, which will have the effect of liberating us from our enforced captivity, caused by the crowding together of the ice, which has held us back for the last three days.

Sure enough, the cold northern wind comes along, driving the ice before it; it slowly effects this change, and the packed ice gradually opens, and it requires all our skill to drive aside the immense floors of ice which threaten every moment to squeeze us between the contracting gaps. But the ice soon begins to stream off, and we begin to comprehend the vexed question of currents flowing south, and the influence of the winds

from the north; our impression inclined to the former theory, and for the simple reason that is obvious to our senses, for when closely packed, the wind causes an undulating motion to be imparted to the sea, and this motion has the effect of rocking the ice to and fro, so that it opens out naturally from the action given to the back water; each separate mass acting on its immediate neighbour is forced by widening the space by concussion to leave narrow channels between, and the lesser blocks being lighter, drift rapidly along, while the larger blocks having a greater draught move more slowly. Presently the whole mass is trending towards the south, streaming as it goes into wide estuaries, leaving bays of various extent and ever-changing form as they go; our good ship is under the same influences, and our men are nearly worn out in their continual efforts to fend off the dangers that every moment crop up around us—at one time we are all intent upon this work, now the ice drifting down threatens to grind us up between the floes, some are more than an acre in area, these seem to close upon us for our destruction; the next moment, the danger being averted, we are making sail in a clear lake of considerable extent, and also trending southwards. One thing appears certain—many whaling captains confirming our observation—that the ice never streams towards the north, any

portions which become detached from the pack invariably taking a southerly direction. Our little vessel dances merrily along in its freedom down the long lanes like some village maiden hurrying to some trysting-place; the lane sides here are not hawthorn clothed with May however, but solid walls of ice on either hand, dangerous, no doubt, yet their formidable aspect is somewhat tempered by the glorious effect of their prismatic colours as they reflect the sun's rays, playing upon them as they stand out of the cold blue water.

To the eastward we observe a thick, dense, dark blue cloud, which to the sailors is an omen of gladness. This indigo cloud is, after all, no cloud, but a reflection of the open water beneath it—water we cannot see owing to our position, but clear water ready waiting to receive us. Everywhere else in all directions the horizon is one dazzling glare of light, and out of this glare we strive to escape in the direction of our goal, steering our ship with obstinate determination to reach the blue cloud.

Our look-out man, seated in his crow's nest, now sings out in gleeful accents: "Them unicorns is a blowing like mad the other side the stream of ice." The sight is a strange one; the beasts with dappled sides are curvetting about close to the surface, the pointed tilting spear thrust from beneath the waves as they rise

with graceful motion and charge along with wild and reckless lunges of their formidable weapons; suddenly they skim along the surface, curving their backs they plunge headlong down, and the moment after, others, as if playing at some intricate game, as suddenly appear in the spot vacated; crowds follow in single file the vagaries of some chosen leader, the mazes of some game, and we watch with unwearying gaze the sport they seem to enjoy so much. Then the idea presents itself of lowering a boat and dashing in amongst them in the hope of capturing a prize. No sooner is the scheme proposed than the crew are ready for the fun, and with a strong pull we are soon alongside the icy barrier. All are eager for the sport; the boat is soon dragged over to the other side and launched in the water beyond; now everything is ready, but their sports are at an end. For some cause, the shifting of the ice, perhaps, or the alarm communicated to the herd by their leader, soon spreads amongst the narwhal, and despite all our well-meant efforts, we are at length forced to give up the pursuit, fairly beaten by the fatigue. As we return to the schooner the older hands inform us that they never knew such pursuit result in any gain; the narwhal at such times cannot be taken.

On the 28th we again came up with the seals, but

the fog always hangs about and robs us of many a chance; certainly it often enables us to steal upon our prey. The doings of the seals to-day were a puzzle to us. That there are days when the birds on a moor will lie well to the dog has not escaped the observation of the mildest sportsman, and it is a question with experienced grouse shooters whether the birds on some occasions are not frightened by some soaring hawk in the blue vault above, into sullen disregard to the presence of the sportsman, or the condition of the atmosphere on these particular days renders the birds, usually so wary, dull and indifferent to their pursuers. Whatever may be the cause, we noticed that the seals crept farther in on the ice, and were evidently reluctant to take to the water when disturbed. Could it have been that some enemy, of whose presence we were unconscious, was lurking there to attack them if they ventured in? This we had no means of explaining, as the success with our guns, firing as we did from the ship's deck, or from the ice itself, when we ventured in pursuit of some great seal whose position justified our approaching in this wise, was far greater than on any previous occasion. The ice to-day was so open we found no difficulty in sailing towards the dull seals, and the boats were sent off to collect our spoils without difficulty, though the labour was incessant.

Boy Jack was a stripling of thirteen years, the son of a hardy seaman, who has determined to bring up the lad to his own calling from his earliest years; having this object in view he was given over to the tender care of our cook. Nothing seems to escape the quick eye of the youngster, and in the late busy adventures he is everywhere, full of childish glee at the prospect of sport like this. "Look," shouts the lad, pointing to a little hecatomb of seals prostrate on the ice, "there! there is a pussy not dead yet, and he's biting his mother!" Sure enough, the young seal evidently is furtively biting at a dead one, and it is equally evident that the poor beast is endeavouring to rouse its parent to flee for her life, little heeding the weapons of the crew, in its almost human solicitude for its natural protector. It is of no avail; a bullet fired by the hand of some considerate sailor, takes the life it could of itself hardly sustain, now that it is deprived of the watchful care of its dam.

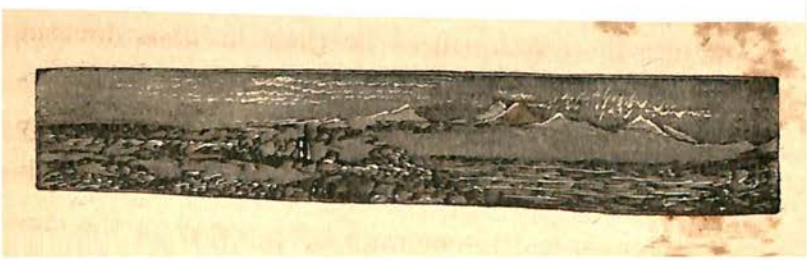
Of all the curious and abnormal modes of progression on land, practised by animals, commend us to the seal. There are walkers, runners, leaping, bounding, hopping, skipping, creeping animals; and these suggest to the anatomist the most dissimilar modes of progression. Some raise the body in erect or semi-erect postures; others, by far the greater number, carry the body hori-

zontally above, and support it on four feet, while others again, as the sloths, suspend the body and head downwards, moving more slowly amongst the branches of trees, with a series of successive clutches of their hooked claws; then there are the various modes by which the feet and hands are approximated to the ground they move upon. Either the foot is placed flat, as in the bear's way of walking, or the knuckles, the rims of the soles, or the tips of the claws are used as the fulcra; the tail again is the means of support to some monkeys and the opossum. By means of the tail in these creatures, the body either hangs suspended or is swung forward in the progress of the animal. But of all the odd movements, and as Dr. Murie says, "the most sadly ridiculous one, is the shuffling, wriggling, belly progressive gait of many of the seal tribe on terra firma." The walrus has been seen to waddle on all fours, and the eared seal has a somewhat similar power of locomotion, but the west ice seals differ little except in size from the ordinary seal of our coasts (unless when the coat is dry, when it is of a lighter colour), except in those cases which are far from infrequent, when there is no coat of fur whatever, and the great animals have almost lost all pretensions to form and outline owing to their inordinate fat. Then, indeed, there is no

mistaking them for any other; all trace in such specimens of the dark patch across the loins by which the species is recognised as the *harp seal*, or saddle-back seal, is lost. The distinguished anatomist we have quoted had a capital opportunity of observing the motions of the Greenland seal in confinement, and he has ably pointed out the difference of the gait of the saddle-back when compared with others. He states that this seal very often uses its fore-limbs, placing them on the ground in a semi-grasping manner, and by an alternate use of them drags its body along. The hind legs, meantime, are either trailed behind slightly apart, or with opposed plantar surfaces slightly raised and shut stiffly behind. On uneven ground, or in attempting to climb, a peculiar lateral wriggling movement is made, and at such times, besides alternate palmar action, the body and the hind legs describe a sinuous semi-spiral or wave-track. And he goes on to state that it was not until he had well thought over this paw-creeping movement of the northern seal that he fully appreciated an incident related by Mr. Charles Davidson, which that gentleman had been witness to in one of his Arctic voyages.

"At more than a mile distance from their ship a solitary seal was noticed lying dozing near an "escape-

hole" on the ice. An Esquimaux thereupon, in his seal-skin garment and hood, formed quite like the head of the animal he was in pursuit of, and with lance and rope coil, slowly crawled towards the creature. For a while it apparently took little notice of him, but at last showed indications of being on the alert. The man by this time was still far off, but the moment he observed the seal watching him, he advanced perfectly seal-fashion, and whilst it steadily gazed, evidently mistaking him for one of its own species, as he at times imitated to very life every phocine movement, he approached within a very short distance. Then suddenly starting up he sent his lance whirling into the creature's vitals ere it could scramble in safety to the blow-hole."



CHAPTER IV.

"Full many a gem of purest ray serene
The dark, unfathomed caves of ocean bear;
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

As the cold of this inhospitable region crept insensibly upon us an incident occurred, simple enough in itself but suggestive of sentiment.

Among the involuntary captives brought away from Old England by our schooner, were a few flies. As for their own special convenience and comfort they had selected our cabin for a home while the craft was lying in port, neglecting to heed the warning when our other visitors left us, they were forced to endure the consequences of their heedless devotion to pleasure. Now English flies were not born to flutter among icebergs, and their delicate frames yielded only to the change of climate. We, on first leaving home, had no manner of interest in the creatures; insensibly drawn to the very few survivors associated with a summer land, their presence in our cabin was more welcome than tolerated, but when the

family dwindled down to one specimen only, a thorough solicitude was manifested for it, and every conceivable means was adopted to save its life. The choicest delicacies we placed before it, but it needed no further help; it could select for itself, and did. Grown sickly with the change of clime, and grown feeble by exposure to the cold, it could no longer venture on a journey to the table, its feeble wings refused their office. Then was the true nature of our hardy men most surely seen; their susceptible natures hidden beneath a rough exterior came brightly out; it was only a fly, but even a fly excited their sympathy, and the fly was welcome. As its powers flagged they lifted it tenderly to the topmost pane of glass in our cabin window to catch the warmest rays of the sun.

Alas! the inexorable laws of climate could not be stayed on account of the fly, and in spite of every attention and care, the poor thing grew feebler and feebler day by day. No longer able to support itself on the pane, it descended lower, yet lower, on the cabin window, till it finally rested on the lowest sill, and before long its watchful attendants were called upon to witness the end of their little friend.

It had rolled over from weakness and lay upon its back, and after many a spasmodic kick it died.

The pity for the living fly was continued to its remains. Nature had composed its limbs in placid repose, and a suitable site being found in which to deposit the dust, it was suitably interred. There was as much propriety in the mourners as is displayed by needy relatives when some rich man dies.

Why should strong men have natures like this? There are pepole who account for such displays of gentleness on patriotic grounds. The fly was their fellow-country mortal! Others that it was on pure ethnological principles easily settled. Was it not the last of its race? Could it have been for its individuality that it was esteemed precious, as a rare coin is hoarded, or a musty tome? Did they believe in metempsychosis, and regard the fly with awe, hoping, in doing their duty by it, they were honouring their grandmother!

After all, it was only a fly. It is sometimes said at the decease of a little one, "It was only a child." But what does the mother think? It was only a fly; and what did the fly think? If the fly thought about it at all, had it noted the gradual disappearance of its companions? Had it no forebodings of its coming fate, no regrets for the past? Had it no consciousness of the kindness of those on board the schooner? Could it understand the solicitude shown for it in the selec-

tion of its dainties? Had it a longing desire to quit so rigorous a region, hoping, perchance, to awaken in the spirit land of flies, where an ever-shining sun brings a paradise for them to sport in? Or was it smitten by that human love of life which makes so many of us hang on earthly existence, with all its cares?

None of these could satisfy us. We set it all down to the cold, and the lack of exciting incidents at that stage of our journey.

The incident was not without its effect upon the men. They had done a kindness, and had received the reward, and yet the loss of their little protégé was not without its gloom. Up in that strange, still cheerless realm of frost, so far from dear friends and home, how knew they but that, like the flies, they might one by one yield up life there, till the last man, without the consolation of sympathy, would leave this unburied corpse "where friends come not."

We continued to wage successful sport with the seals all day, and at five in the following morning, at a council of war, we decided that, as our object was not so much to fill our ship with blubber as to get on with our sounding observations, which really was the object of our journey north, it was better to put an end to our sealing, as the time and weather was precious to

us, and there were symptoms of a change for the worse in this respect; but there is much fortitude required when the game abounds and the chase exciting, to draw off when it seems at its best. Nevertheless we have to return again to the somewhat dry demands of scientific inquiry. Many a cup of coffee did we sip that night as we sat over our pipe without the least sense of weariness or fatigue, in the fine bracing air of the far north. Coffee is a far more acceptable beverage than wine or brandy of any kind in these regions. In the warm latitudes spirits seem essential at such a time, but here the system seems to reject the stimulant, and tea or cocoa are more highly prized.

Our ambition is to reach some point to the north of Spitzbergen, as the ice is about to open, where we may complete our work commenced last year. Besides there is the ground-seal to be found on the coast of Spitzbergen, and the prospect of other game to console us for the seeming loss we are about to endure as we leave these teeming hunting-grounds.

Getting away to the eastward is by no means easy work, and another scrape on our false keel signals us from below that the shocks we occasionally encounter in our course have not been without effect upon the tough schooner's sides. Next day we take it easy, and the 29th is a perfect day of rest on board;

the men sleep off the effects of yesterday's rough toil.

The men are satisfied that our seemingly new plan of sealing (by sailing our ship itself in their direction) is far preferable to the one in general use—in foggy weather especially. If silence can be secured on board, the ship slips through the thick atmosphere, and she may easily be mistaken for a harmless iceberg. Gliding along the sea, just out of reach of the long tongues of ice, but still near enough to shoot the basking seals. The small icebergs are often muddy and discoloured near the water's edge, and black blocks of ice are not uncommon. In this way their resemblance to a ship is not so difficult to comprehend. The men inspect their weapons and spin yarns as they give themselves up to a few hours of idle enjoyment. Next day, the 30th of June, the sun shines out upon the silver sea, whose surface is without a ripple. No one has as yet described the loveliness of an Arctic summer's day, and we shall not be betrayed into the attempt. All nature enjoys the calm, and the little roaches (mergulus) in large flocks, forgetful of their constant employment in the search of food, give themselves up to long hours of enjoyment; they come whirring past the bows of the schooner, and wheeling in their rapid flight, they rush with a surprising sound

of wings past the stern. A great whale in the far distance comes up to blow, and after watching his movements for some time, we are compelled to forego the chase, as he is far beyond the bounds we would be justified in venturing after him.

Next morning as Byers is on watch, a whale appears. This time there is no difficulty in the way, and as everything depends upon the steady action of the crew, he gets his men quickly and quietly together and leaves the ship. So orderly had been his plans, we did not know what had occurred until after he was well away in the pursuit.

> "So forth they rowed, and that ferryman
> With his suff oares did brush the sea so strong
> That the hoare waters from his frigot ran
> And the light bubles daunced all along."

We ran on deck and saw the whale on the surface of the sea, spirting up the expressed air from his lungs like jets of water, but in reality it is a fine vapour cloud which easily condenses in this cold air, and looks, at a little distance, like water. In the far distance the land (some forty miles away) fills in the view, like the frame to a picture. The mountains, lit up with the various effects of light and shade, seem only fifteen miles away; but the vast height of the distant peaks, seen through the clear air,

confuse our power of judging the distance; nor are we alone in our difficulty. We read somewhere of one hardy explorer of the early days, who after vain attempts to gain the land he saw so distinctly, and which always seemed to baffle his attempts, at length, in superstitious dread, turned his back upon the scene, fearful of being beguiled by some enchanter's trick; and we now do not wonder at his simplicity. All this time we watch the harpooner steadily gaining on the distant object, the wondrous beauty of the scene before us and the sport in hand dividing our admiration and combining to fill us with such a sense of enjoyment as we have rarely felt.

The little crowd around us are plunged into the same sea of ecstacy. No one breathes a whisper as the eyes are strained to observe every motion of the pursuers and pursued. The boat seems to glide rather than creep upon its prey, who lies all regardless of the impending danger, and at the distance we are, the suspense grows painful. Suddenly, like lightning, something has happened, and the shout is raised, "A fall! a fall!" Before the echo dies away, the crowd, as if released from some enchanter's spell, is now a confused mass of bustling, hurrying men, as they rush to assist the crew in the first boat. Men come tumbling up from below, half clad, clutching in

their hot haste such clothes as are snatched hastily as they run. Here are fellows but half awake, dropping into their places in the boats, with oar in hand, impatient to give way when the rest are in their places. There is no time now to waste, and for the present the garments are scattered anywhere. By-and-by a chance may come in which they may get time to dress. In the meantime the whale, hard hit by the trusty Byers, has plunged headlong into the depths below.

In some ten or twelve minutes 500 fathoms of line has spun itself out over the boat's bow into the sea, measuring the course the wounded whale has run in his agonised fear of the too certain fate awaiting him. The boat, dragged through the water, throws up a spray from the divided wave, and the bollard smokes and fizzes with the friction of the line. We overhaul the boat just as the line is all paid out. We bend on our line. "Look out! look out!! Keep away, or I can't fire again!" shouts Byers, in his eager way, as he sees the indications of the whale's reappearance. Up he comes, a frightful sight to see—the great tail lashing the water into foam, the fountain this time a jet of blood. We slue our boat round, and pull hard, in the hopes of getting a shot; but to no purpose. We are out of range, and miss

our chance. "Pinch him all you can!" "Not an inch of line more than you can help!" "He is well fast, and no fear!" Such are the warnings and precautions of the harpooners one to the other, as they make their several dispositions before the fellow dives. Once more the two boats are dragged towards the place where the whale had just been. The water is made foul by his slimy back, and the air is full of the foul odour peculiar to the cetacean. Down plunge the bows of the boats as the unseen cause drags onwards and downwards in his efforts to free himself from his tormentors, but with no avail. Each man is now fully alive to the danger of the enterprise he is engaged upon. All sit with eager eye upon the line, ready, too, in case of a capsize, to jump for dear life into the icy stream, to take what chance may offer of being picked up.

Again the whale is on the surface; this time he is out of breath, but is getting ready for another mad effort to free himself. Our gun is charged with a rocket, a steel-tipped bolt, fatal and deadly beyond compare. If it but strike the object aimed at, then its course is certain; rending and burning its onward course it soon penetrates to the very centre of its victim, and there it bursts asunder, causing such a wound as will rob this giant of the seas of its life. Eddy

stands prepared, his stern face tells of his responsibility. The whale is close to us, and as the chance offers the deadly missile is driven with horrid force into the quivering flesh, and after one short dive, one dying struggle on the surface, the huge leviathan lies floating dead.

We cannot tell of the excitement of a chase of this kind—by comparison all other sport is tame—the size, the vast strength of the whale, the danger, the scene altogether, cannot be told in words, and while all are evidently full of the thoughts such a scene will raise in the brain even of the dullest amongst us, we are too preoccupied to care to express ourselves, and almost in silence we fasten our prize by the tail with a rope rove through two holes cut in the broad extremities. This rope we trice to the bows of one boat, and we tow it towards the schooner; then, indeed, we give vent to our pent-up thoughts in three hearty cheers, whilst the bottle is passed round with many a hearty quaff to success to the future.

Then ensued a scene of laborious toil greater than that endured in the capture. The flensers, with their sharp spades, dug out and stowed away the precious blubber with many a song and cheery laugh, turning the great mass over with great toil as though it were mere child's play, and a sport most enjoyable.

In whaling ships the men agree for a small stipulated sum per month, barely sufficient to purchase the requisite clothing for a voyage of the kind, trusting to find oil sufficient to create a fund by their share of half-a-crown per ton on the return to port. Therefore, each man has a special interest in the ship's success; hence the zeal displayed by the crews when the hunting grounds of the whales are entered upon, and the look-out man is kept well to his work by the ever-expectant crew, who are altogether dependent on his quickness of vision.

The sailors said they had often noticed the strong resemblance to the head and face of a man in the roof of the right whale's mouth, and we regretted not having examined for ourselves this very remarkable circumstance. They were so confident in their statement we had no reasonable cause to doubt them; and as many tales, sayings, and opinions were in use amongst these worthy people which evidently had been accepted as *traditions* which might easily be traced to a remote date if one had time for so curious a line of study, it would be well worth examining this strange conformation of the palate of the whale, to see how far the resemblance would warrant the foundation of a tale somewhat similar to that we read of the Prophet Jonah, for though the Scriptures state that Jonah was swal-

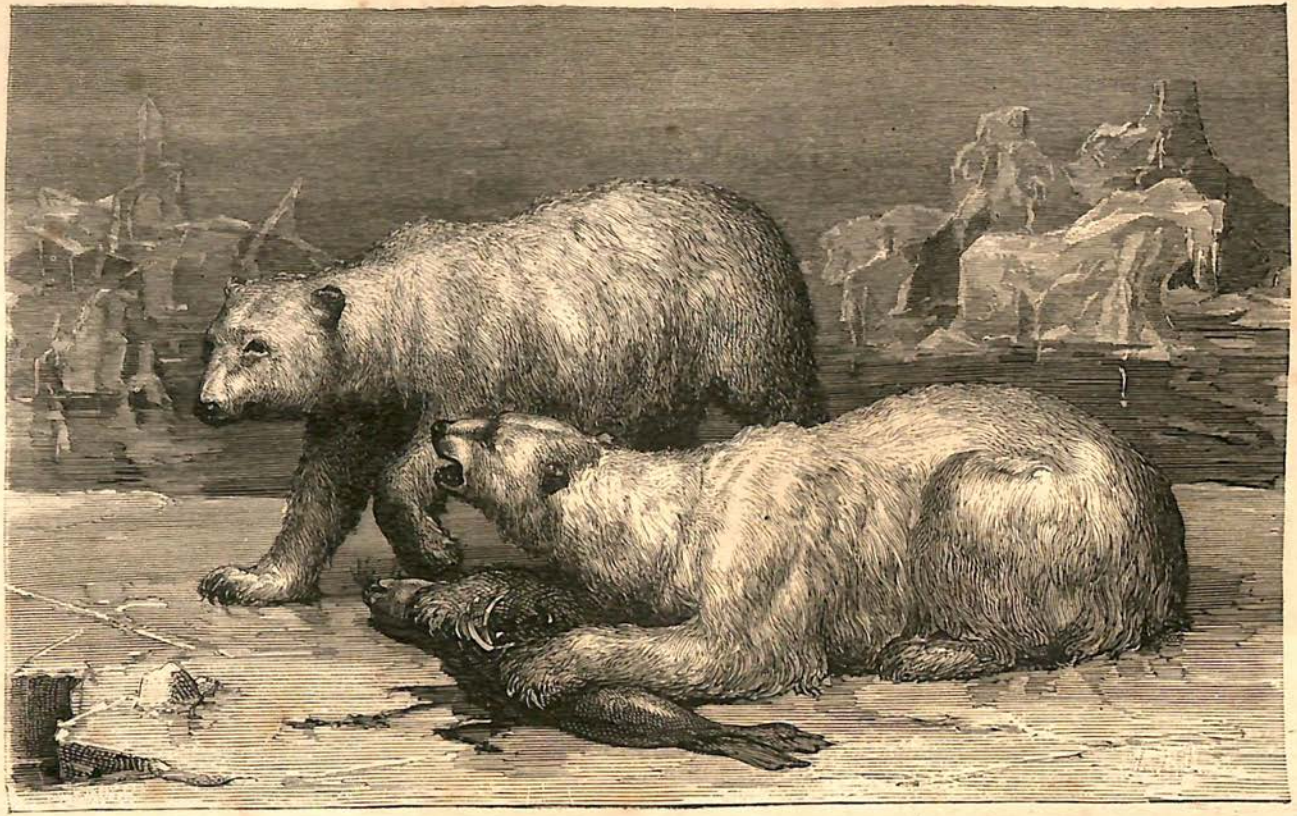
lowed by a "great fish," it certainly could not have been a whale that had the felicity of his presence in its interior, as the throat of a whale is no larger than that of an ordinary bullock. If the likeness to a man's face in the mouth of the whale was known to the men of old time, (and there is no reason to suspect that the fact was overlooked by them,) then it is easy to comprehend the allegory.

July 2. We have a high sea and a stiff breeze; we carefully observe our old whaling captain's instructions and keep a good look at the point ends. In this way every deep bight we see is canvassed as to its capability of sustaining whales, narwhals, bears, or seals. Eddy reports a whale blowing near the ice, but there is a peculiarity about the ice which may deceive even his experienced eye. Wherever stones, or *débris* of any kind, happen to rest for any time upon the ice, a hole is soon made through it for some reason, perhaps owing to the opacity of the object; the sun's rays act upon it, and the heat generated in this way thaws the ice above. Through these holes the water is driven up from below with great force, and comes rushing through with a hollow sound, somewhat like the noise made by the whale as he rises to the surface of the sea. This solemn sound in the still air, when perfectly calm in a land-locked bay of ice, is startling when

heard for the first time. At first we thought that the sound proceeded from the ice itself, and as we stood listening for the repetition of the noise, we did not fail to notice the grandeur of the ice around us. Beautifully iridescent caves rose out of the pure water beneath, in whose recesses we saw the upper edges festooned in a curious manner with what seemed a network of lace composed of the finest gems; these fringes glistened in the prismatic light with every motion of the waves, and the fairy halls were filled with sounds as strange as its glittering decorations. Each vast block as it surges against its neighbour causes a moaning wail to reverberate throughout the caverns, and the shock, each time it is repeated, sends down thousands of splinters which fall with a crash resembling broken glass. But Eddy's practised ear was not likely to be mistaken; we now see it plainly. The sailors persist in calling the great mammal a "fish;" he has no dorsal fin, but is perfectly straight-backed, as he sports along the water. We follow him stealthily, hoping he may enter the bight where all is calm and still; there we may let down our boats, an act which in the sea outside would be attended with risk and absolute danger. We follow him in vain: after tacking and following him for some time he dives and we lose him altogether. Sailing into a deep bay formed by the ice,

we begin to suspect the presence of another whale, when the boy Jack cries out, "A whale, a whale!" and receives condign punishment forthwith. This boy in his sleep often starts up with the same wild cry, in spite of the regular correction he receives from his father in whose bunk he sleeps. We sail along, passing through narrow strips of ice into inner lakes of open water, the ice growing larger as we proceed; the hard snow-covered surface occasionally rising into hummocks as we go. Here are floes of ice twenty miles in circumference, and fields of ice of several acres in extent. We see numbers of narwhals, but all our efforts to capture them as they swim northward prove unavailing. Next day we are forced to wait patiently at one place for a considerable time, and remembering the experience we had gained on a previous occasion we watch anxiously for the coming of some sleepy narwhal into our own scrap of open water. The hours seem to drag along wearily as we wait, and it is in the midst of our patient waiting the man from the nest aloft suddenly announces the presence of a polar bear, probably attracted towards us by his keen scent. As there is a likelihood of the chase being a protracted one we make all our arrangements with fitting care; our rifles are examined, and the men provide a rope and haak-

pick, feeling certain that we shall have some use for them. Far out on the great ice field our surly customer is seen lumbering towards us; while a boat is being got ready to cut off his retreat should he take to the water, we step down upon the ice; on its surface, large pools of fresh water about a foot in depth spread themselves in all directions. Our hunting ground rises gradually from the water's edge—a vast plain diversified with hummocks of snow-covered ice. At first we busy ourselves in selecting a course to avoid the pools; our boots are well adapted for wading, but we desire to gain upon Master Brownie with as little noise as possible. We are forced, however, to wade, and worse still, to go right through a deep snow-drift in search of the bear, of whose whereabouts we have not the slightest clue. Suddenly, he comes into view of our party, and presents an appearance as unlike the white-coated beasts we see in the Zoo as it is possible to imagine. On the contrary, we see a gaunt, pale, yellow, hungry-looking brute, swaying his sharp-cut muzzle from side to side in restless indecision. Whether it is the momentary fear of danger, or the usual habit of the Arctic bear we could not then say, but we wished he would adopt a more steady and dignified bearing for a few minutes to enable us to take a more certain and deliberate aim. We



BEAR AND SEAL.

Page 107.

learned afterwards that his hang-dog look and apparent confusion was assumed; for the men on board were able to follow all his movements, and from them we gathered that so far from being unaware of our tactics, the wily traitor was himself practising all his cunning in his efforts to cut off some straggler from our party. With this evident object in view, he was seen to make a large circuit, running from hummock to hummock, and hiding behind every elevation in his course as he stopped to listen to the sound of our tramping feet. In this way he had managed to pass nearly to our rear, and another two hundred yards would have exposed us to an attack from a quarter we little expected he would have been found in. The great paws of the Arctic bear are admirably adapted for rapid and noiseless walking upon the ice and snow drifts. To prevent surprise we talk of the necessity of the rear man of the party in our next bear exploit walking backwards to keep a good look-out.

When the beast found he was observed, he drew back to conceal himself behind the hummock nearest to him, and displayed no fear whatever. Our companion ran round to a point from whence he could see Master B. waiting for us, and the opportunity presenting itself he took steady aim, and dropped

the bear with a well-directed bullet. The body rolled over into a pool of water, and as he was quite dead it hardly needed the stout kick delivered by an incredulous looker-on to satisfy himself of the fact. Then the men proceeded to flay the hide. There was not the slightest trace of food in the miserably contracted stomach, and we were puzzling over this strange fact, unable to account for the vitality of an animal so empty, when one of the men volunteered to explain by what means the bear's life is sustained. According to him, when food fails these Arctic bears, a gland behind the middle claw in the hollow of the foot is sucked by the starving beast, and by this story, whose truth the man implicitly believed in, he unconsciously confirmed one of the oldest fables recounting the peculiarities of Bruin. We ourselves, however, had no opportunity of witnessing this interesting operation.

We now set to work in earnest. Attaching the rope to the hide, we dragged it towards the ship, while some of the men made a bonfire of the carcase. As the men make up the fire, we examine the powerful structure of the limbs; flat and without any indication of strength when viewed from the front, the fore-arms are a vast network of powerful sinews, when looked at in profile,—the paw attached

to these powerful limbs proves that it needs no second blow to secure its victim, and the encounters of bears with seals no longer seem incredible as we gaze on these massive limbs, one net-work of muscular fibre. One man is laden with our rifles; the rest follow, dragging our hide after us—a laborious operation, and we are heartily weary of it by the time we reach our ship. This successful bear-hunt affords much material for comment. The season opens earlier this year than last, as no bear was killed in the former cruise at this date, and everybody is busy speculating on our chances. Every one on board settles down into a charming state of rest, and it is only by chance that one of the men goes on deck, and, looking over the side, sees another Brownie gnawing at the hawser! Had he crept aft and informed us of his discovery, we should then and there have added another bear-skin to our collection; but, taken aback by the awkward propinquity of ursus arctus, he holloas out Bear, bear! In an instant every one seizes a gun and rushes on deck. Bang go the bullets in all directions, —one fellow jumps on the ice and starts in pursuit, getting in line of our fire, so that whatever chance we might have had is robbed by our too eager hunter. A long shot may do wonders, we think; and so we hasten after the retreating bear. By good luck a

bullet is lodged in the near hind leg, which sadly impedes his flight, and we gain on him every step we take. Another long shot stops him altogether; not in the least deterred, we dash into the bitter cold water where he has fallen, in our anxiety to secure him. In a trice the bear is dragged out and divested of his outer covering. This fellow was as empty as his mate, and in this state his temper is sure to be at its worst point. The want of food may be a common thing amongst the family generally, but regardless of their savage nature, we go single-handed towards the fire smouldering in the remains of his companion, in the hopes of picking up a third bear. We are forced to return empty handed.

The well-known "Polar" or "Ice Bear" is not now nearly so plentiful as in former times, and is rarely seen at the present day between lat. 59° and 66° in Mid-Greenland. The Company of Royal Merchants in Greenland give the natives about five rigsdaler (11*s.* 3*d.*) for the skin. Occasionally there are a number killed near Cape Farewell, which come round on the annual ice-drift. There a curious custom prevails, viz., that whosoever sights the bear first—man, woman, or child—is entitled to the skin, and the person who has shot it only to the blubber and flesh, which is said to be, especially the liver, poi-

sonous when eaten. The Eskimos on the western shores of Davis's Straits carefully prohibit their dogs from devouring any portion of it. Its light creamy colour, rarely purely white, except when young, has gained for it, as we have said, the name of Brownie from the Scotch and Shetland whalers. Sometimes it is called the "Farmer," from its very agricultural appearance as it stalks leisurely over the furrowed fields of ice.

Its principal food consists of the flesh of seals, in whose pursuit it is indefatigable; but it is omnivorous in its diet, and will often clear an islet of eider ducks' eggs in the course of a few hours. The rage of the animal on its failure to secure a seal by such artifices as we have mentioned is boundless. It roars hideously, tossing the snow in the air, and trotting off in a most indignant frame of mind. During the sealing season, says Dr. R. Brown, both in Greenland and Spitzbergen seas the bear is a constant attendant on the sealer for the sake of the carcases, in the pursuit of which it is sometimes "more free than welcome." He had also often seen it feeding on whales of different species which are found floating dead. In 1861 he saw upwards of twenty all busily devouring the huge inflated carcase of a *Balæna mysticetus* in Pond's Bay, on the western shore of Davis's Strait. The party

were foolish enough to fire a few shots among them, when the bears sprang furiously from the carcase and made for their boat. One succeeded in getting its paws on to the gunwale, and it was only by the vigorous application of an axe that they succeeded in relieving themselves of so unwelcome an addition to their crew. On the whole, the conclusion Brown comes to, is that the polar bear is not a very fierce animal when not enraged, and he thinks that a great deal of the impressions which we have imbibed regarding its ferocity are more due to old notions of what it *ought* to be rather than *what it is*, and that the tales related by Barentz, Edward Pelham, and other old navigators were a good deal exaggerated. When enraged or emboldened by hunger, it is easily understood that, in common with all wild and even domesticated animals, it may be dangerous to man. Though seemingly so unwieldy, the *nennok* runs with great speed, and being almost marine in its habits, it swims with perfect ease and dives with a natural grace almost as well as an ordinary seal.

It has been chased over the ice on many occasions, as every one is aware who has looked over the pages of the Arctic records, and the mother bear on many occasions has been observed to manifest the most tender solicitude for her offspring—helping them with

a display of reasoning powers one would hardly expect to find. When her cub begins to fail in its powers of locomotion, the old one has been seen to stop and encourage it, sometimes pushing it along before her; and when hard pressed lifting the little ones out of the water on to the edge of the ice floe as a cat lifts her kittens. Richardson, Parry, and others mention the fact of the white bear being found a long distance from land swimming in the open sea. Then there are the stories and traditions of the whalers, such as that one of the bear in hard times sucking at its own paws, to extract sustenance from its own system to support itself; as well as others to the effect that it builds for itself houses in the ice, and of their gambols therein; as well as encounters with the walrus, affording ample matter for whaling sailors' yarns whenever the subject crops up amongst them on sight of a "Farmer."

As for the question of the winter hybernation of the bear, there are many conflicting opinions. Those kept in confinement do not help in this inquiry, for the conditions of its life are entirely altered; but it is supposed that the female retires for some period of the winter, and the old males only partially hybernate. The young of the bear on making its first appearance in this world is the smallest infant we know of when

compared with the vast bulk of its parent; it hardly equals in size a spaniel puppy of a few days old.

The bear of the Arctic regions does not hug like other bears, but bites at his opponent; and he declines to eat his captive until life is quite extinct. Like a cat, he plays with the victim. Amongst the Eskimo of Greenland he plays strange pranks, often creeping upon the hunter whilst busily flencing a seal, and tapping him on the shoulder with his powerful paw. Then it is the unfortunate man's cue to "feign dead," so that when the Brownie retreats a few paces to enjoy the prospect of his intended meal, the gun can be got ready before he returns again to the attack.

Byers has not been idle. On the open water near the ship he has watched for a narwhal, and without much difficulty has fired the harpoon right through the "fish." It has no horn, and the men are hard to satisfy respecting this peculiarity in the individual captured. The oil is abundant, however, and this is some compensation in settling the obscure question as to the want of a horn; had it been a female there would have been no question raised.

The wind shifting brings down the ice upon us, and the threatened danger fills us with apprehension for the safety of the ship. Some smaller bits of ice come crunching and grating against her sides,

and we determine to push out into a more secure position.

The crow's-nest signal man, in the early morning, informs us of a bear being to windward, about four miles away, attracted probably by the odour of his grilled companions. Our friend, with his harpooneer Byers, goes in pursuit, while we mount into the rigging to see their plan of operations. We see them mount a hillock, and look in all directions with their glasses for the grizzly monster; but in vain. They pull round to another point with similar result. Growing tired of the tedious delay, we get quietly below, and the men not knowing the moment when their energies will be tried to the utmost, creep back to finish their sleep, leaving the schooner deck a few minutes quite deserted. The bear steadily advancing, takes the water and gets upon the ice we are moored to. The look-out man, detecting the manœuvre of the sly beast, again spoils our sport by yelling out the tidings; and before we can do anything the bear has galloped off into space. On the boat's return we are ashamed to recount our adventure; as the tables are turned, we laugh over the cunning generalship of the bear. Waiting behind some heap of snow which effectually concealed him from his pursuers, he must have slipped by them and so gained upon us without attracting attention. As an-

other instance of the animal's cunning, we may mention that Byers once saw a seal upon the ice a short distance from the breathing hole it also uses as a means of escape in moments of danger. A bear, after seeming deliberation, dived under the ice, and thrusting its paw through the hole, struck the seal a blow which killed it.

We perceive our bear still lurking about at some distance, disappointed of a meal, and grown impatient at his failure. He runs hither and thither, dodging out of view behind every little inequality in the ice, and always coming nearer to the smouldering carcase. All this time the aspect of affairs about us wears a threatening look, and the wind rises rapidly; the ice comes upon us at a pace that is certainly alarming. We are about fifteen miles from the outer edge. Our lake, in which we float, is rapidly contracting, and although we cannot complain of the action of the wind upon ourselves, the falling barometer warns us of a gale on the outer verge of the ice, whose force is rapidly increasing. Some ice presses towards us from the southwards—a circumstance to be noted, as ice never comes in this direction unless driven by strong winds. The large pieces continue their course towards the south, heedless of the gale, drifting to certain destruction. Now the question grows serious—What shall

we do? Had we a steamer, there would be little difficulty in forcing a passage out, but this southerly gale may so encumber us with ice we shall find ourselves, after all, but farther away from the pack.

We do all that can be done. We press on all sail, and fight our way to the south-east. The trial is too much for us. The result is not as we had expected. Had we gone towards the north-east, or had we remained as we were, we might have done well; we certainly would have done better. Had we gone to the north-east, when we had the opportunity of doing, all would have been well with us. Had we even remained, the temporary difficulty would have adjusted itself; and our little vessel, under the shelter of some protecting "point-ends," would have rested securely enough, while we could have found time to enjoy the pursuit of the game which abounded in the neighbourhood.

It happened otherwise. Experience, however laboriously obtained, is of no avail, if it is not accompanied with sterling common sense; and we sail to the south-east, and fall into the open trap. We cannot get through, and the ice surges backwards and forwards for miles between us and the open sea. Large streams of ice scud past, and we tack through the best openings we can find; the swell lifts the little vessel

aloft and brings her down upon a great piece of ice with a force which sends her shivering from stem to stern, but her stanch timbers are equal to the shock, and she seems none the worse.

Now we miss stays and make a stern board, losing our headway. This endangers our rudder, but it is stoutly built, and resists the hardest knocks. We get her round, and run at high speed between two blocks of ice that threaten to crush us up.

This danger being averted, there is a pause in which every heart feels grateful to a merciful Providence for an escape so unexpected. We were now forced to make fast to some ice, and in a short time we were in a sea of water as calm as a pond; the ice closing us in on all sides was like a low wall opposed to the outside waves. Weary with labour and watching, our sleep is now only disturbed by an occasional trembling of the ship's timbers as she gets a squeeze from the ice pressing upon her sides. For the next seven days we are beset. The men pass the time pleasantly enough with various extemporised games, and with keeping a good look-out for game. We go in quest of snow-birds, and one afternoon we see the curious and good-humoured antics of a mother bear playing with her cubs. These savage animals are not devoid of tender affection towards their offspring in times of

happy undisturbed repose, but when roused by cruel treatment they are ever ready to exert all their maternal instinct in defence of their offspring. It is during these seven days we devote ourselves to a scientific examination of deep-sea temperatures in the Arctic seas. An account of our operations is deserving of a chapter on that special subject.

CHAPTER V.

"Where the North Pole in moody solitude
Spreads her huge tracts and frozen waters round."

In the following remarks there are points respecting the temperature of the Arctic Sea, to which access is obtained through the broadest gateway to the North, *i.e.*, that between Greenland and Norway, the portal of which is guarded by Spitzbergen. In the western portion, along the coast of Greenland, it is more or less blocked with ice, and the water is cold. In the eastern part, in the vicinity of Spitzbergen, there is warm water and an open sea at certain seasons of the year as far north as 81°, and in some years one or two degrees further. Nearly all the discoveries in these regions have been made by persons engaged in commercial enterprise; so that, even when favourable opportunities offered, their interests restrained them from taking advantage of the same.

In 1871 Mr. B. Leigh Smith made a cruise in his

schooner yacht *Samson*, and reached 81° 24′ N., with an open sea before him, comparatively free from ice. The pack-ice was drifting southwards, and the water at the surface was 33° F., while at 300 fathoms it was 42° F. This fact was observed by Captain Scoresby in lat. 78° N., 0′·10 W., surface 32° F., and at a depth of 760 fathoms 38° F. In 1872 the cruise in which we had the pleasure of assisting, gave the following results. On this occasion the sea was crowded with ice, and, as we have said, the ship was beset.

The ice had evidently required more than one year for its formation ; its surface was covered with opaque snow, and was generally flat, and in no case rose higher than the gangway of the little schooner.

Owing to the floes presenting a comparatively smooth surface, with a total absence of icebergs, we were led to form the opinion that no land can exist in the vicinity immediately north of Spitzbergen, as the southerly drift would be sure to bring down floating bergs, which are always formed in the valleys of northern land.

On this occasion observation with the Miller-Casella thermometer confirmed the result of the previous year, viz. gradual increase of temperature at great depth. On July 12th, when in 80° 17′ N., and when the vessel was fixed in the ice, the temperature gradually

increased to 64° F. at a depth of 600 fathoms. These facts indicate the southward flow of a vast body of warm water. It cannot be said that the heat is derived from the Gulf Stream, because nowhere in its course, even in such latitudes as 50° or 60°, does it acquire so high a temperature, even at the surface; and it is highly improbable that the general warmth of the ocean along the west coasts of North Europe, on the shores of Norway, could possibly be supplied by the limited body of warm water which leaves the Gulf of Florida. If the whole of the Gulf Stream water were spread over the warm-water area in the north, its depth, even allowing the most liberal estimate for its volume, would not exceed ten fathoms; whereas warm water of 42° F. occurs to the depth of 400 fathoms in this region, and north of Spitzbergen it is found as high as 64° F. at 600 fathoms. If it be said that this temperature is due to the northward drifting of the Atlantic from warmer localities, we are met by two difficulties, of which one is, that the soundings obtained by Carpenter and others gave temperatures much below 64°, and the other is, that the waters flow south, not north. Volcanic action, or a warm mineral spring rising from the ocean-bottom, may by some be imagined to be the cause of the temperature of 64°; but there is no evidence of either of

these agencies, and it is quite reasonable to suppose any other feasible cause. Passing over the discovery of 64° F. at this depth, we still have to account for the water of 42° F. flowing southwards, as evidenced by the increase of its temperature as we proceeded northwards.

It is clear that this question of temperature requires further investigation; and it is also clear that whatever the result may be, it will materially affect all the prevailing theories respecting oceanic currents. It is not improbable that this warm water flows from the circumpolar region; and if so it would indicate a circumpolar sea.

Many facts are known which are consistent with this view. Every year the edge of the pack-ice, and the ice-fields themselves, break up and drift south, at a rate sometimes equal to thirteen miles a day, as found by Captain Parry. This does not occur when the northern ocean is wholly covered with ice, in the winter season. The drifting of the ice (as also currents) implies a sea free of ice somewhere in the north, occupying an area at least as extensive as the drift-ice. As has been seen, some of the ice is the result of more than one year's growth; and as the ice travels southerly, say, from four to thirteen miles or more per diem, a similar area of open sea must be simultaneously forming round the pole, the ice-holes

and clear spaces in the drift-ice being quite insufficient to make up for the space left by the ice during the summer. The great abundance of animal life in the waters of the highest latitudes reached indicates that the water is not ice-cold; and the migration of numerous species to the north of 80° shows that the means of subsistence can be obtained. There is reason to believe that whales occur far to the north of 80°; and if so, there must necessarily be sufficient open water to allow of their finding ready access to air.

In the Spitzbergen seas a blue, cloud-like appearance is well known as a sign of open water; and this has been seen on the distant north horizon even by ships which have been beset by ice in the highest latitudes. Icebergs, it is well known, waste more rapidly below the surface than in the air, causing them to topple over frequently, obviously the effect of the warm current.

The question, then, is, from whence do the warm waters come? and how do they acquire their heat? And this is one of the questions which a polar voyage by way of Spitzbergen would almost certainly elucidate. Another important subject of investigation would be the conditions under which the prevalent north winds of high latitudes originate. There is one argument bearing upon the temperature of the circumpolar

seas which should not be overlooked. During six months of the year the sun is above the horizon; and although the rays may be oblique, still the waters may acquire a higher temperature than under similar conditions farther south, owing to there being little or no cooling from nocturnal radiation, and probably to the constant dryness of the air allowing the sun to strike with full power. During the winter these causes would intensify the cold.

The occurrence of warm water is by no means confined to the sea around Spitzbergen; but, before referring to other regions, we may mention that a set of instruments for taking soundings and deep-sea temperatures was supplied this year by Mr. Smith to Captain David Grey, of the whaler *Eclipse*, whose father, in the year 1855, supplied the valuable information and survey of the extension of Pond's Bay, now called Eclipse Sound. His observations were made in the middle of the sea, between Greenland and Norway, and along a line running north-easterly from Iceland. They coincide with Dr. Carpenter's observations, proving the termination of the Gulf Stream. In June, 1854, Morton advanced beyond Kennedy Channel, and saw open water as far as the horizon, visible from a hill 500 feet high. The wind was from the north-west, and a rain cloud was seen in the distance above the open sea. The water was setting in a strong current south, and

the ice along the shores was in a rapid state of dissolution. The water was found in the several places tried to be well-above the freezing-point; and in one place, some distance from the ice-foot, and at a depth of 5 feet, the temperature was 40° F. There was a strong tide from the north. Kane's vessel wintered in Renselaer Harbour; the strait was bridged across by ice, with a current running south flowing beneath it. Although the open waters above alluded to may not be direct evidence of a comparatively mild circumpolar region, yet the stream of warm water coming from the north seems to indicate it.

Where can this water acquire its warmth? Sir John Richardson suggests that it is derived from the warm area near Spitzbergen; but this is not supported by evidence, which indicates that in both areas the water comes from the north. It has been suggested that it is a continuation of the Gulf Stream, apparently because it is supposed to supply all the warm water in the Arctic seas; but if there is no reason for believing that the warm sea around Spitzbergen derives its heat from this source, it is still less credible in the case of the Kennedy-Strait water. It has been suggested that the source of warmth is the northward flow of the general mass of the North Atlantic. If this did account for the warmth of the Spitzbergen area, although this view would be with difficulty reconciled with a southward

flow of Arctic water, it would be quite inapplicable to the Kennedy-Channel area.

Temperatures taken by us gave the following results :—

1872.	Station.	Lat.	Long.	Depths in fathoms	Temperature.			
					Air.	Surface.	Min.	Max.
June		° ′	° ′		°	°	°	°
1.	1.	68 52 N.	6 40 W.	600	42	37½	30	37½
13.	2.	75 6 N.	2 30 W.	100	36	31	28	35
15.	3.	75 7 N.	3 48 W.	100	36	32	28	35
				50	..	31	29½	32½
17.	4.	76 13 N.	2 22 W.	100	34	31	29½	34
18.	5.	76 3 N.	0 10 E.	150	35	33	30½	40
				200	..	33	30½	48
19.	6.	76 21 N.	1 5 E.	150	35	32	30½	32
				250	..	32	30½	39½
20.	7.	76 35 N.	0 3 W.	6	34	33	30	33
				25	..	33	30	35
				150	..	33	30	39½
22.	8.	76 41 N.	2 10 W.	150	35	32	29½	39½
27.	9.	77 18 N.	5 0 E.	25	37	34½	32	34½
				250	..	34½	32	39
July								
1.	10.	78 20 N.	7 2 E.	6	36	36	33	36
			,,	600	..	36	33½	36½
6.	11.	79 54 N.	6 34 E.	6	35	34½	33	34½
				12	..	34½	33	35
				25	..	34½	33	37
				50	..	34½	33	37
				200	..	34½	33	40
				Bottom				
7.	12.	80 4 N.	5 12 E.	600	37	34½	31½	39
10.	13.	80 23 N.	9 0 E.	12	35	31	28	31
				50	..	31	28	31½
				Bottom				
12.	14.	80 32 N.	9 50 E.	600	36	31	28½	64

Among the many advantages that would result from

circumpolar research and the following up of this warm current, not the least important would be the insight which it would probably afford as to the regulating influences of the weather of North Europe, or generally of the northern hemisphere. Meteorologists have long suspected that the weather in Western Europe depends in some way upon what has happened in the vicinity of the Pole. The many advantages to be gained to science by circumpolar navigation cannot be doubted. Among them would be careful observations of the currents and temperatures of the surface and at various depths, and organisms which doubtless would be obtained by dredging, as far as practicable, in the bed of the Arctic Sea, in the highest latitude, and the probable extension of the whale-fisheries, as well as the discovery of new land, should such exist.

June 1.—The edge of the ice was 170 miles distant, and the warm water was found at the surface, and cold water, which is of greater density, below.

June 13.—The sounding was taken at the edge of the pack. If the experiments had been continued, increasing temperature would probably have been found at a lower depth, as was the case further north.

June 15.—To-day we were well in the ice, and had only time to sound in 50 fathoms; but even here we found an increasing temperature.

June 17.—Being far in the ice, we only found a slight increase.

June 18.—A second sounding, 50 fathoms deeper than yesterday, when sailing among large pieces of floe-ice, gave an increasing temperature up to 48° F.

June 19.—To-day we had an increase of 7° above the surface temperature at 250 fathoms deep, although but 10 miles distant from yesterday's soundings; but the ice was more open: probably evaporation occurred here, owing to the surface not being so closely covered with ice.

June 20.—The first sounding shows the water to be coldest at the ice-foot; the second and third prove the increasing temperature, which, as we were somewhat more closely packed in the ice, increased more quickly, and 39° F. is obtained at 150 fathoms deep.

June 22.—Here we were more closely packed. The surface was a degree colder than yesterday, and the water at the ice-foot had also gone down half a degree; but the warm stream below was the same. If we had had time to sound at greater depths, the temperature of the water would in all probability have been found still on the increase.

June 27.—In this case we have the warm current clearly defined at 250 fathoms depth, being kept below

by the lighter ice-water, which is nearly fresh, and of less specific gravity.

July 1.—We were clear of the ice, and had a lower temperature than before obtained. If the flow of warm water came from the south, the surface-temperature would have been greater than any temperature as yet obtained, because of the absence of ice.

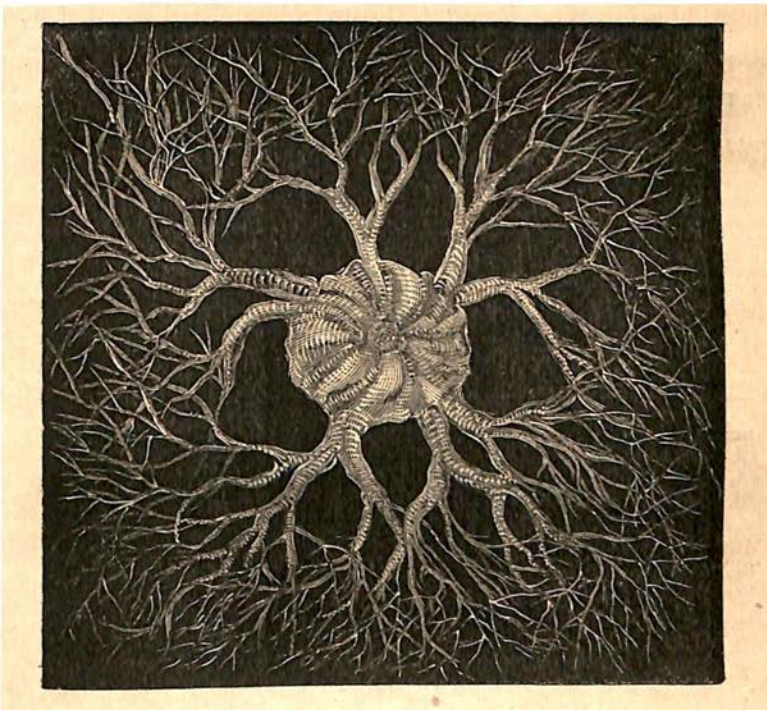
July 6.—This observation shows a gradual increase as far down as 200 fathoms. We were well in the ice, and were prevented from continuing our sounding operations. Little evaporation has taken place, owing to the closeness of the ice and the gradual increase of the temperature, with one exception, which occurred on the 18th of June, when a temperature of 48° was obtained,—showing that the temperatures are materially affected by local causes, the closeness of the pack or the opening of the ice allowing evaporation to take place.

July 7.—Here, where the ice is close, there is a great difference between the surface temperature and that at the ice-foot. We pulled up a very beautiful description of star-fish (figured on the opposite page), which would not be likely to inhabit this warm current were it of volcanic origin.

July 10.—The crew being required elsewhere, we could not continue our sounding experiments. The

sounding shows a decrease of temperature, owing to the ice-water.

July 12.—This remarkable sounding was carefully



registered, specially by my friend, who saw the index before it was immersed, and immediately on its coming up. This shows a gradual increase of temperature towards the north, proving the current to come from the north; and its temperature being above that of the Gulf Stream, where it disperses itself, is a proof it is in no way connected with it.

The thermometer has since been examined by Mr.

L. P. Casella, who certifies that it "has been tested in the hydraulic press, as well as carefully compared with my standard, and found correct in every way, no change whatever having taken place in the instrument."

Temperatures taken by Capt. David Grey, of the *Eclipse* whaler :—

1872.	Station.	Lat.	Long.	Depths in fathoms	Temperature.			
					Air.	Surface.	Min.	Max.
April								
13.	15.	68° 45′ N.	13° 58′ W.	220		29°	28·8°	32°
15.	16.	68 52 N.	15 40 W.	220		29	29	31·5
20.	17.	68 12 N.	16 40 W.	270		28·8	28	31
May				Bottom				
14.	18.	75 0 N.	16 20 E.	85		29	29	32
June								
6.	19.	78 20 N.	0 20 E.	400		30	30	33
8.	20.	78 14 N.	0 18 W.	220		30	29	30
				400		30	30	32
18.	21.	75 5 N.	6 15 W.	400		32	29·5	32
				200		32	30	32
23.	22.	74 50 N.	6 50 W.	100		32	30	32
				400		31	30	32
July								
3.	23.			200		34	30·5	34

April 13, 15, 20.—When these three soundings were taken the ship was frozen in the pack ; still there is a slight increase of temperature at the lowest depth.

May 14th.—Off Bear Island.

June 6, 8.—Here *Eclipse* was 75 miles inside the pack.

June 18, 23, July 3.—Made fast to a large floe, about 90 miles inside the pack.

CHAPTER VI.

"Ye who love the haunts of nature,
Love the shadow of the forest,
Love the wind among the branches,
And the rushing of great rivers
Through the palisades of pine trees,
And the thunder of the mountains,
Whose innumerable echoes
Flap like eagles in the eyries,
Come not here."

TUESDAY, the 13th, brought the wind round to the westward, and the ice naturally began to slack off. We take advantage of every turn of the ice. Now a lane opens, and with sails set we glide over the space without impediment. All our object is to keep our schooner's bows to the eastward. We can do no better than drift with the wind. The labour on board is unceasing; the men at night are divided into parties by watch and watch, all hands by day. We adopt every plan we can devise to break off the "point-ends" with our long axes, ice-slices, and crow-bars. The windlasses are continually at work, the warps are out, fastened to ice-anchors; these require continual shifting. The men force the ship through

every narrow channel. Her bows serve as a wedge to drive asunder the obstacles. Some of us, going in advance of the ship, force open a channel by pressing the larger blocks out of our way, the openings thus made soon filling up with lesser ice. But after all our exertions it often happens she cannot be got into the passages we have constructed in this way. The services of the harpooners are now fully tested, and the knowledge they have gained in the old whaling ships is invaluable to us now. They know this work well, and, being accustomed to it, give confidence to the rest. A steamer would of course make light work of these difficulties which to our sailing vessel are almost insuperable.

The fog lifting at this time, we descry land, and that blue cloud which indicates unfailingly open water beneath. Now we press on down a narrow channel of some two hundred yards. A block of ice checks our course; this removed, we are in a little sea, guarded by a neck of ice which acts somewhat like a gate; this too is rent open, and we at last sail upon the open water, clear as far as the north foreland.

In the far distance we clearly see high perpendicular rocks, culminating in snowy peaks.

We now steer direct for Moffen Island, hoping to go from there to Vertigen Hook, and thence to the Seven Islands, where the Swedish Expedition intend

building their winter residence, their object being in the following spring to start from there, when they hope to reach the North Pole in boats dragged over the ice, before it is broken up by winds, &c.

In the previous year the schooner was fortunate in gaining these islands, and had she been provided with steam-power, there was no reason to anticipate failure in sailing into the open sea to the north as they saw it clearly indicated in that direction. On that occasion she had no difficulty to contend with but the superstitious fears of the Norwegian captain and crew (the wind was blowing hard from the north-west, and the ice, scattered in every direction, was streaming to the southward, leaving occasional open water, and offering no impediment to the vessel's northward course), which could not be overcome. It is to no purpose, then, that any sailors but Englishmen can ever hope to "gain the gold," as the Arctic voyagers fondly name the object of their ambitious hopes. With an English crew we are without the least fear of failure, if all goes well with our ship. On, then, to the north-east of Spitzbergen—on towards the hunting-grounds where the walrus will supply us with fresh means of Arctic enjoyment.

It will be remembered that Parry gained the point 82° 45′, and he assuredly might have gone farther north had he but started at the right season for sledge

travelling, and had he been supplied with suitable appliances for the laborious journey he entered upon even at the close of the season; had he used light boats instead of the heavy ones provided in which his daring experiment was attempted; but no one could have succeeded in dragging two boats, each weighing 3753 lbs., being heavily laden with stores, over such ice as he that year encountered, which, as he got to his farthest point north, he found to his dismay was drifting at the rate of fourteen miles each day to the southward, through the long lanes of water and open lakes. Had steam power been known in the days of Parry he would, no doubt, that season have gained the Pole by its assistance, and by this very route, which may be truly called "The Gateway to the Polynia."

We have a light breeze on the 28th July, and the look-out man sights Moffen Island. Weary with the delays of beating to windward we leave the schooner, and, with a well-manned boat, we go in search of the land, hoping to meet with walrus on our way. A four miles pull brings us no immediate prospect of land. Mounting a hummock of ice which has a smoother surface than usual, we seek in vain for the land with our glasses. After another four miles pull we take another view, and this time see a low, flat, black-looking land in the distance. This must be the island we are in

quest of, and we give way with a will, only halting for a time to kill a seal and a few dovekies (*mergulus*), which offer too tempting opportunities to neglect them. We land upon the crater-like formation which rises hardly above the water, and the shingly shore has but one break in its circumference, opening to the westward, not, as it is figured on the chart, to the northward. The vast sheet of water enclosed is covered with ice, which seems to have remained there all the year. Numbers of eider ducks, usually sociable in their habits, were found here, but wild and difficult to kill. The drakes, especially shy, could have had little experience of the tender solicitude bestowed upon their kind by the good folk of Iceland; or in migrating north, it is possible that they laid aside their company manners, and with the change in their habitat had assumed a wilder nature and a greater fear of human beings. C. W. Shepherd, in his admirable account of the birds of Iceland, mentions a visit to an island but three quarters of a mile in width, where he found "on the coast, a wall built of large stones put above the high water-level, about three feet in height and of considerable thickness. At the bottom, on both sides of it, alternate stones had been left out, so as to form a series of square compartments for the ducks to make their nests in. Almost every compartment was occu-

pied; and as we walked along the shore a long line of ducks flew out one after another. The surface of the water also was perfectly white with drakes, who welcomed their brown wives with loud and clamorous cooing. When we arrived at the farmhouse the mistress gave us a cordial welcome. The house itself was a great marvel. The earthen walls that surrounded it and the window embrasures were occupied with ducks. On the ground, the house was fringed with ducks. On the turf slopes of the roof we could see ducks, and a duck sat in the scraper." The eggs of this bird differ somewhat in size, the rounder is supposed to contain the germ of the future duck, the longer contains the drake, having a smoother, larger, and a thicker shell. These ducks are not now so numerous where they are every year disturbed for the sake of their down, for which, in the breeding time in Norway and Iceland, they are so carefully protected.

We have a long pull back to the schooner. She has come nearer into the land, and the fog, as it lifts and falls, shows her enveloped in a hazy mist. From her deck, as the air grows clearer, we enjoy the glorious scenery of Spitzbergen. The coast is resplendent with glaciers here and there along the water's edge; the vitreous heaps glisten in the sun's rays, reflecting all the colours of the prism. Above them a

vapoury cloud floats like a girdle in mid air, and above this again, the thousand needle-like peaks of the mountains rise to a prodigious height; the mountain tops are clad in snow, and stand out in bold relief against the leaden sky. Snow lies in patches on the precipitous sides of these mountains wherever it can find a resting place out of range of the sun's rays. This pure white contrasts strangely with the rocks around. Their sombre hue is due to a clothing of a curious lichen, inky black in colour, and this black colour is intensified by the play of light upon the surface of the rocks it clothes like a garment, the effect of the transparent atmosphere being to bring out the lurid white of the pure snow, and to give a strange aspect of deep mourning to the veil of lichen thrown over all. Nothing could harmonise more perfectly with this awfully solemn aspect of nature, or add more to its grandeur than the colour of the sea beneath. It is possible that even scenery like this may have no attraction to some who have witnessed it. To us it is all absorbing, and we linger long over the multitude of combinations which everywhere arrest the gaze; as we sit and look upon the wondrous sight spread out before us a great curtain of fog slowly descends and shuts out from view every trace of the magic scene.

All through the next day the ship is being forced

WALRUS.

Page 201.

along her course against a north-east gale, and with all our efforts our progress is but slow. Moffen Island slowly passes out of view, and our shiphead points towards Vertigen Hook. We are every moment arrested on our way by some great block in the ice, and though we make some progress, our position is unfortunate. All this time we are contending with the ice that we see between the land and the much desired clear water we would fain approach.

In the clear water we sight a small Norwegian fishing smack making easy way, and from the sounds that come booming over the hollow sea from time to time we conclude that their sport is excellent. The masthead look-out now sights the walrus in the distant waves; while a boat is being prepared we satisfy ourselves with a hurried view of the gambols of these strange beasts. There they are, tumbling over and over in the water, enjoying the calm, or basking in the warm rays of the sun, lying listlessly on the ice. The water is dotted with their great black grizzly-bearded heads, with trenchant tusks 18 inches long, as they rise and sink on the little waves. To reach them it will be necessary to haul our boat and all the needful appliances for the chase a good mile and more over the intervening ice; and as we settle down to our work we think of the journey the Swedish Arctic men pro-

pose to themselves, and wonder will they ever accomplish what they are about to attempt.

At last we are at the water's edge and we launch our boat. Everything is carefully adjusted and our seats are taken. We pull down the lakes of water, our thoughts full of the coming sport. Presently we come upon the herd, and we row gently towards two great fellows floating on the water; to all appearance they are asleep—they are almost touching each other—but as these animals are highly endowed with intelligence, it is just possible they are holding sweet converse together. The herd, observing our motions, draw near to us as if to warn their companions of the danger; but we hold steadily on, and when quite within range, by some unaccountable failure we miss our aim. Do the whole pack vanish out of sight like seals in a similar adventure? Not a bit of it. The walrus shows no fear, but, on the contrary, the herd comes charging down upon us with awful looks and threatening growls, the older ones bellowing out their defiance, and all rearing half out of the water, splashing the surface with their flippers as they come. Their heads are truly horrid-looking; the muzzle, projecting somewhat, is furnished with thick masses of coarse, beard-like bristles, their eyes start wildly from their heads, and the two slightly-curved fangs, sharp pointed, are seen

protruding from their distended jaws, as if the beasts were determined to rend the boat's side asunder whenever they can get the dreaded opportunity. The harpooners dissuade us from firing at the crew of sea-devils, not "sea-horses," as they are called. If struck in a vital part they sink like lead, tail foremost to the bottom. In such a place it is hopeless to recover the carcass, and wanton destruction of a walrus is not to be thought of. We wait, with feelings strained to the utmost tension, as we cannot divest ourselves of the seeming necessity to guard ourselves against the threatened attack of so formidable an enemy; and while we wait impatiently for the adjustment of the clumsiest gun in use at the present day, or ever used in the chase of any animal (we mean the harpoon gun) the whole herd, having found, perhaps, that our first attempt to injure them was a failure, on a sudden changed about and fled with the speed of phantoms. A chase is always an exciting affair; but a chase like this is hopeless. In spite of all our efforts we find it impossible to come up with the fleeing walrus, although they tantalize us by showing themselves between the ice, just out of range, every now and again. We never come within range even for a long shot, and no harpooner that valued his reputation would risk a shot he is not sure of. For the sake

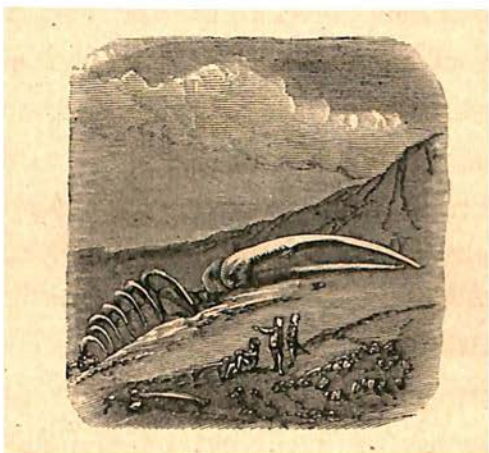
of the hardy men who risk so much in a pursuit so fraught with danger, men of skill and science should devote some attention to supply a want so great as this. At a time when so much thought and money have been expended upon projectiles and ammunition of every kind, it surely is hardly fair to the whaler to let him go on his dangerous venture with no better weapon than that now in use.

We had worked to the opposite side of Moffen Island since our last visit, and being curious about its proper bearings, we went on shore for an observation and took our compass with us. The result proved that we were correct in our conjectures. Here we picked up two rare birds (*Tringa cinerea*).

Resting upon the beach at some considerable distance from the water's edge we saw a whale's skull of rare dimensions. It was in beautiful preservation, blanched in the sun's rays; the remainder of its bones are being gradually covered up in the shingle and accumulated *débris* drifting with the frequent icebergs that are driven against the coast; from this cause it is easy to see that the island is gradually rising above the waves. We saw the various inscriptions which cover the skull, recording the many visits to the spot by Norwegian and other whalers, and we stumbled over the vast accumulation of walrus remains collected there

after some successful raid of a former hunting party, whose gain must have been enormous, judging from the number of the slain whose bones lie bleaching in all directions.

The ice has drifted round Moffen Island from the westward, and we are still within its influence; and seeing no prospect of any immediate release, we go away on a walrus expedition. We find the pursuit of



this game entirely different from that of the seal, and having no previous experience lose many an obvious chance. In this way we approach a large bull walrus resting on the ice, but he catches the sound of the boat as she grinds against some floating ice, and before we are prepared he slides gently back into the sea; as our bullet strikes full on the back of his head, making his death a certainty, he sinks into the water

out of our reach. We were in hopes that the wound was less fatal, and that he would rise again to the surface. Armed with a hand harpoon, we are over the spot where he went down, almost in time to strike him, but he has sunk to rise no more. The schooner, still beset, is drifting to the westward; but as evening approaches, we begin to have hopes of escaping into the open water. Then, as if to mock us, every tack we make with that object seems but to increase the cold resolve of our jailor to keep us within his firm grip. The harpooners are so accustomed to this kind of treatment, they are almost indifferent to it all. They say the ice forcing its way is carried by a strong current to the southwards, as they with perfect coolness fend off each seeming danger as it presents itself and tack and tack again towards the clear spaces. Now and then we receive a thump on our ship's stout timbers; but she seems intent only on obeying the steersman's will, and, as if aware that in the position of danger we now are, everything depends upon her disregard to the blows, bravely bears her punishing, and she in turn delivers her blows full tilt against the enemy as he rushes against her with impetuous force. We watch her cool defiance in silent admiration. She seems to us to say—let it come! we are prepared. One hard knock, well delivered against a field of ice,

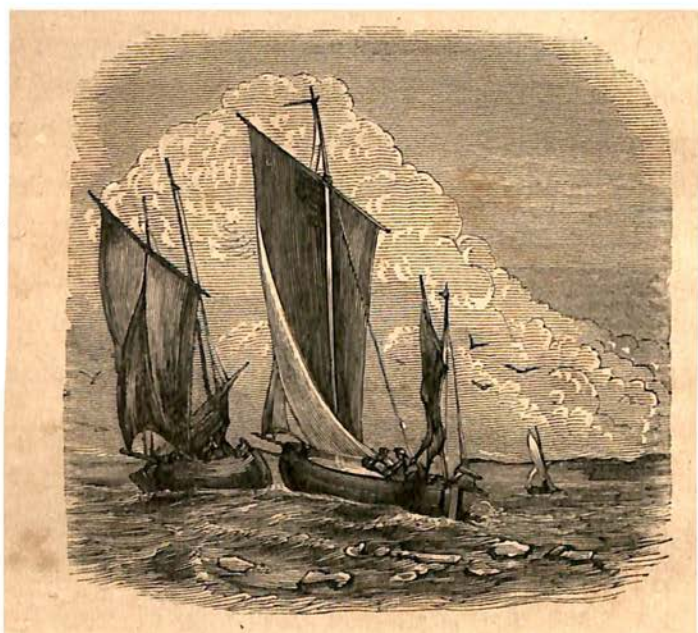
and what seemed inevitable is instantly averted, the mass slews round, and we glide into smooth water, the vessel is laid-to, and a short respite gives our men the sorely-needed rest they require before all hands are called upon once more to face new dangers. This time our difficulty comes from the water, which, rushing like a mill-race round the point-ends of ice, gurgles and foams with frantic haste to get past the obstacle. This time the water wins. Our ship misses stays; she no longer works with that cool indifference we had but recently been applauding. Something is evidently wrong with her, and we are not long in doubt. A piece of her keel becoming detached, has got across her bows, and impedes her efforts. We strive all we can to remove the impediment, without success. A rope is lowered, with a noose and slip-knot, in the hope of jerking off the broken timber, firmly held by an iron bolt. We are perplexed to understand the extent of our injury, and the success of this attempt may only make matters worse by breaking away more than would be desirable. On we go, bumping now without the power to direct the schooner towards the blows we are receiving, and once more we are slewed round by the forces we can no longer contend against. At this moment a deceitful tongue of ice projects from the field for some distance beneath the surface, and

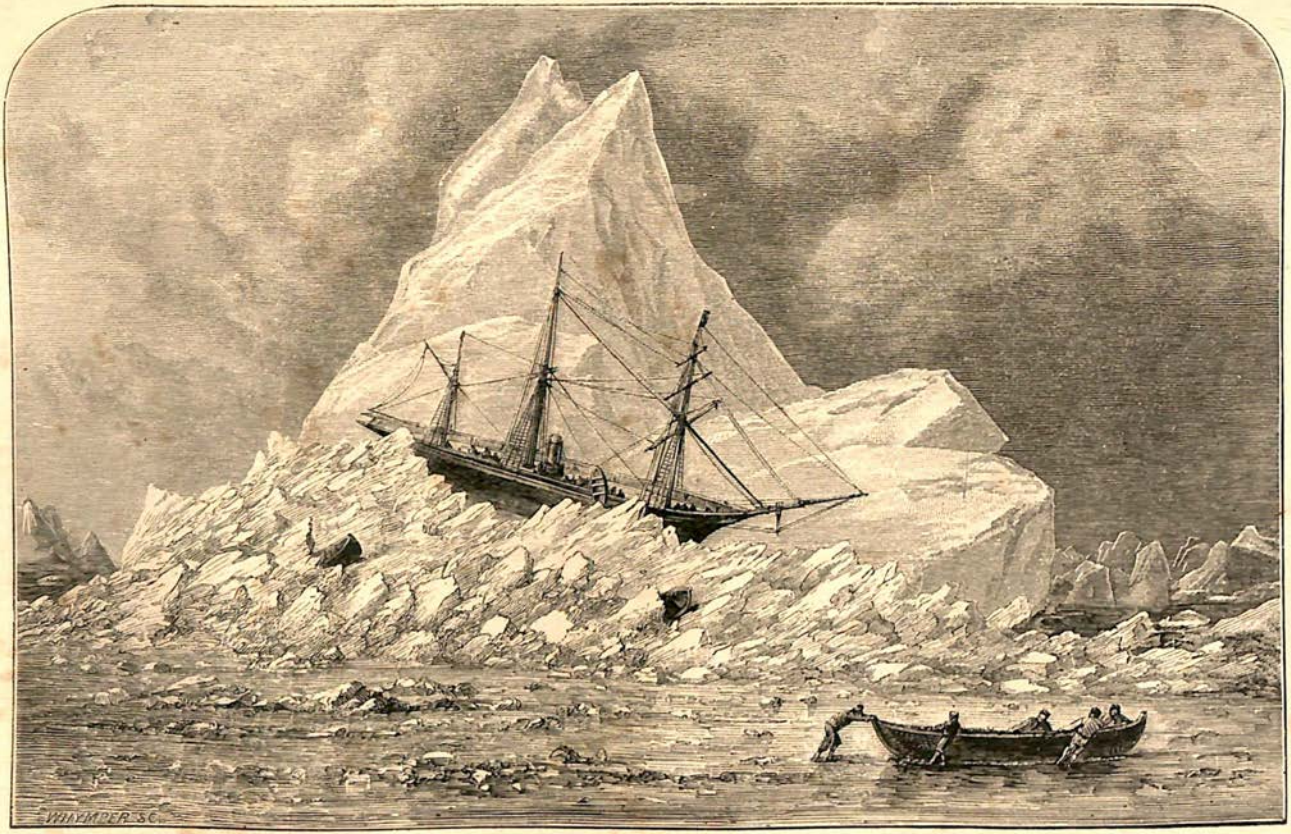
on to this hidden floor we glide without power to help our ship. The almost worn-out crew have to pluck up energy sufficient to avert our new danger. They hasten to remove all the heavy lumber in the fore part of the schooner to add weight to her stern; they run along the deck and jump in the hope of giving her motion; others make strenuous efforts to cut the ice asunder beneath her keel. In the midst of the toil, which may be rendered futile should we be blocked up by fresh accessions of ice, the schooner gently and of her own accord slips back into deep water, and we breathe again. There is no time lost in trying to get her well to windward, as the ice is rapidly getting to the westward, and it will never do to be driven back. For three days this struggle is carried on with hardly an hour's respite, and these three days seem an infinity of time to us all. The wind, coming up from the south, had probably been the cause of all our present trouble, as in the previous year there was no difficulty of this kind to contend with, and we are again confirmed in the oft-repeated opinion, that had we but steam-power to assist us, we should have escaped from all the fatigue which had now nearly exhausted us. One thing is quite certain, these encounters with the ice are as nothing when compared with like difficulties in Smith Sound. There, in the narrow channels, the currents flow

at the rate of some seven knots in the hour, and the ice packing, is driven against ice adhering to the land. Acting against such fixed masses the driven ice is overlapped with that it is forced against, and little icebergs are quickly formed by the accumulatation of heaped-up floes.

In this way the ice is formed into vast bergs, rugged and torn, dashed up into heaps, one thickness overlaying another, and giving the ice the appearance of laminated floors. The ice to the westward of Spitzbergén is no doubt rough in places, but the roughness is easily accounted for. In general the surface is perfectly level, and it almost satisfied us that it is formed upon the surface of the sea, which, getting broken up in the spring, sometimes receives the portions of some toppling iceberg rudely broken off, and the fragments strewn about make what hummocks and other rough projections are seen upon its surface. In rough weather it is possible that two wedge-shaped masses may be driven together with sufficient force to lift some luckless ship that may be in the way some distance into the air; but the chances are greatly in her favour that the cause being removed the ice will slip back into its former position and restore the uninjured craft once more to her place upon the sea; in fact, the experienced men who sail in these seas, with whom

we have conversed, mention several such instances, but the Smith Sound ice combinations are rarely if ever seen by them in these seas we have been traversing.





ICE IN SMITH SOUND.—(From a Sketch by an Arctic Officer.)

Page 210.

CHAPTER VII.

* * * O Piloto, desta não era Inglez, bom Cosmografo, e com algum conhecimento da Astrologia; se servira o principe de Orange * * * * e que da derradeira vez, que foi o anno de noventa e sinco (1595) chegára a oitenta e dous gráos do norte; e que com ser a força do verão, e os dias quasi continuos, por não haver noite, senão se era de duas horas, achou os frios tão excessivos e tantos caramolles e neves, que se des faziam por aquelle estreito abaixo, que dando de rosto na sua não, a fizeram voltar."—DIOGO DE COUTO, Decad. xii. cap. ii.

THAT the Greenland whaling men also experience the kind of disasters recorded in the Smith Sound expeditions we had ample opportunity of collecting. One out of many such we give.

Here is the account of a vessel in search of Sir John Franklin in the year 1851, furnished by Captain Cator, who kindly gave us the information. He was at this time in company with Captain Sherard Osborn. The *Intrepid* was moored to some land ice; a sudden gale came on; for a long time the hawsers held, and the ship was likely to ride out the storm, when suddenly the land floe they were fastened to broke with a loud crash and bore down, taking the ship with it. There was no time to extricate themselves, and as it came, crushing all before it (a tongue of ice jutting out

from a huge iceberg that lay aground close by), with terrific force she was lifted up, as piece after piece was forced over the others. As they reached the edge, the enormous pressure of the ice against the berg they were upon lifted the *Intrepid* high above the sea. Her keel was within forty feet of the surface she had been floating upon, and though but slightly injured herself, some of her boats were miserably crushed. In one short half-hour this misadventure fell upon them, and the men busied themselves in preparing for their escape in such boats as were left; and when everything that could be thought of had been done and all was ready for a final leave-taking of their ship, the ice gave way with a crash that destroyed everything within reach. The boats and their stores were lost. At last the ice on which the ship rested settled again into its position, and the ship slipped down off the ledge upon which she had been resting.

Our object in recording this disaster here is to prove the danger of ice when driven on a coast such as the east coast of Greenland, or the entrance of Smith Sound by some strong gale of wind. Each piece as it arrives careers over the field already there; the huge obstruction soon grows top-heavy, and overbalancing carries annihilation to everything beneath its influence. The men sailing to Pond's Bay and

Lancaster Sound are often subjected to accidents of this kind, and often experience like dangers further south. Should a vessel be crossing Melville Bay, in Davis's Straits, in a southerly gale, she is most liable to suffer some such nip, if she is fortunate to escape worse treatment from the ice. On this account we believe the insurance offices do not take up policies for this expedition. Old men tell of many a good ship's hull now lying in Melville Bay, whose object was, if possible, to escape the dangers that there beset them on their way north into Pond's Bay. Beyond these straits, again, other and as terrible dangers await the Arctic explorer.

In comparison with these trials, our own seem almost insignificant; but nevertheless we had severe difficulties to contend with until the 29th. We had certainly some good chances of following up our Arctic field-sports, which we were not slow to set about when the opportunities offered. Our success is not worthy of being recorded, although it gave us much occupation. The seals were harder to kill than the west ice-seal (*Phoca Grænlandica*) we had been first introduced to. These fellows were laden with blubber, and gave only the poorest chance, as their fat sides and their small heads present a difficult object for a floating marksman. As the day wears on, our ship gets clear, and a breeze springs up from the

westward. We are once more on our way to the clear water between the land and the ice we have been hemmed in with. We see a Norwegian fisherman in the distance, and make for his ship to see what sport they were having. What words can describe our mortification on suddenly discovering that our little ship has sprung a leak and is settling in the water? We endeavour to preserve a decent composure; yet it is easy to see that the effort is enforced, and all faces wear a look of ill-concealed anxiety. We look uneasily about to see if assistance is near at hand, and fortunately for us there are two other Norwegian whalers within reach, who will be glad to earn money for their services. So we bear down upon the Norsel Jack of Tromsoe. The skipper, after tendering his advice, is earnest in his inquiries. All his thoughts run on the seals we have killed, and he laughs at the account we have to give, although our cargo would sink his craft. He has killed 135 seals, and is making his way to Moffen Island in search of walrus.

From him we learn many valuable particulars as to the anchorage we are now compelled to seek. It is calm, he tells us, under Grey Hook; but beyond, in Widdie Bay, there are big waves rolling under a strong wind whose direction is exactly the reverse of our own, which is barely perceptible.

We have just sufficient wind to move us slowly along, and we make for Albert Dirke's Bay. There is a belt of ice off Grey Hook; through this we must pass. The wind causes a heavy swell to break upon its outer edge. We get the boats out and tow our poor wounded schooner towards a safe haven. The swell breaks heavily on the ice as we approach. We fear to drift broadside on—a disaster which would be fatal to us. Having this fear in view, we give way with might and main. It is a hard task we have undertaken; but we go through with it without a murmur, and her head is kept steadily to the ice, although the current is dead against her weight. As she rises to the top of the swell, she drags us astern, in spite of all our efforts to keep her headway. Our anxiety increases as we approach the danger, and our thoughts are divided between the leak and its effect and the coming struggle with the ice. The tough hands of the crew are blistered with their exertions before we got hold of the tail-end of the breeze, and worked into it. There our labour ceased. The schooner worked easily into Albert Dirke's Bay; there the ice occupied all the space, and we were forced to try Hecla Cove; but before midnight we haul to the wind and beat up the Fiord. The wind blowing hard, we are forced to use the pumps all the time.

The wind in the morning favours us considerably, and we run under Gilles Island, where we find tolerably good anchorage, and a beach suitable to our purpose. This island is not marked in the chart.

On the 1st of August two boats go away—one party to arrange for beaching our schooner; we in the other to look for game. The land here is peculiar in its shape. At a short distance from the sea the mountains rise abruptly out of a plain of their own creation by the constant detritus washed down the steep mountain sides, which fill all the foreground with the newly formed soil; the mountain torrents stream down and wear deep chasms in this level plain; the ground is strewn with beautiful flowers, and a kind of willow, which is almost a creeping-plant here, grows over the moss-covered ground. We go gently along this charming coast-scene, and as we go we pick up a seal, who suffers for his temerity; the noise we make has no effect upon him, and he persists in following us, so we shoot him in the water and harpoon him before there was time for his sinking altogether.

Although the ground does not differ from ordinary wild places where we have often been in search of wild game, the eye in roving over the landscape misses the presence of verdure of any kind worthy of the name, the vast mountain sides are destitute of green places,

one would naturally expect to find, and it soon became dreary work wandering in their awful presence. Great boulder-stones alone gave some relief to the tameness of the melancholy and solitary plains, but these inequalities of the surface left a sad and unsatisfied impression on the mind.

None of these sympathies which are roused by the sight of familiar objects, which in some way contribute towards satisfying our wants, and so become associated with our existence, and serve to celebrate in some way our supremacy in creation, existed here.

It was in these vast solitudes, surrounded by the sea, laden with so many unconquerable difficulties, that we began to inquire with ourselves into the enigma of human existence. Nothing here helped to sustain the ideas gained by education or naturally implanted by human vanity. Man never existed here, and the puny attempts he had made in his endeavour to settle for a season looked as if they were only preserved to illustrate how unchangeable are the laws which control his actions. Here the imperfections of his nature are constantly displayed in his want of power to cope with the creatures which roam at will over the almost barren land, or haunt the ice-covered ocean surrounding us, only proving the

belief, that the world is only made for us and for our convenience, is sadly at fault; and nowhere on this earth does man feel his weakness and insignificance so much as here, amid this awful desolation.

This was the fitting place for the ascetic of old, who would torture himself by seclusion from the world he feared, lest it might fill his soul with exultation and the vain pride he strove with such anxiety to extinguish.

It is true the ground in places was strewn with fair flowers, and there were, in places, broad patches of brilliant green; but they were so few and far between, their existence seemed only a mockery, and looking from them to the awful grandeur of the surrounding mountains served only to heighten the desolation that surrounded us. There was but one effect which served as a relief in all this solitude; it was the peculiar Arctic light which brought all these varying aspects of nature so vividly before us—the clear, unaccustomed light which during the hours of the day glorified everything it illuminated. We ourselves partook of its influence; our health was at its best: we breathed more freely; we enjoyed everything. Our elastic spirits knew of no check. We possessed an energy which knew of no exhaustion. Only a slight change in the action of this clear atmosphere recurred

at regular intervals, and a perceptible chill crept over the face of nature. In this way only were we warned that night was approaching, or had for a short interval interrupted the seemingly life-long day.

To-day, a group of fine reindeer were seen nibbling on a level plain near to the mountains, and the prospect of fresh meat for dinner stimulated the sportsmen to the utmost. Our last joint of meat had gone through the various phases of cooking, known only to thrifty housewives at home. Judiciously carved, the second day it was warmed up again; and on subsequent occasions it appeared as a stew, as a grill, and finally the bones, in true sailor fashion, appeared in a "makeshift;" but with a good appetite for sauce, and a glass of sound champagne, it furnished a meal not to be despised. Meat, in these high latitudes, appears to suffer less from exposure to air than at home. All this time the deer are browsing on such scant herbage as they can pick up, and we prepare to stalk them after the Highland custom. Creeping into a water-worn chasm, which has all the appearance of having been scoured out by the drainage from the distant hills, we endeavour to get within shot; but the wily deer seem to regard the water-worn gully with aversion. Finding the scheme hopeless we return, to concert measures for some more certain means of getting within reach. Yesterday we

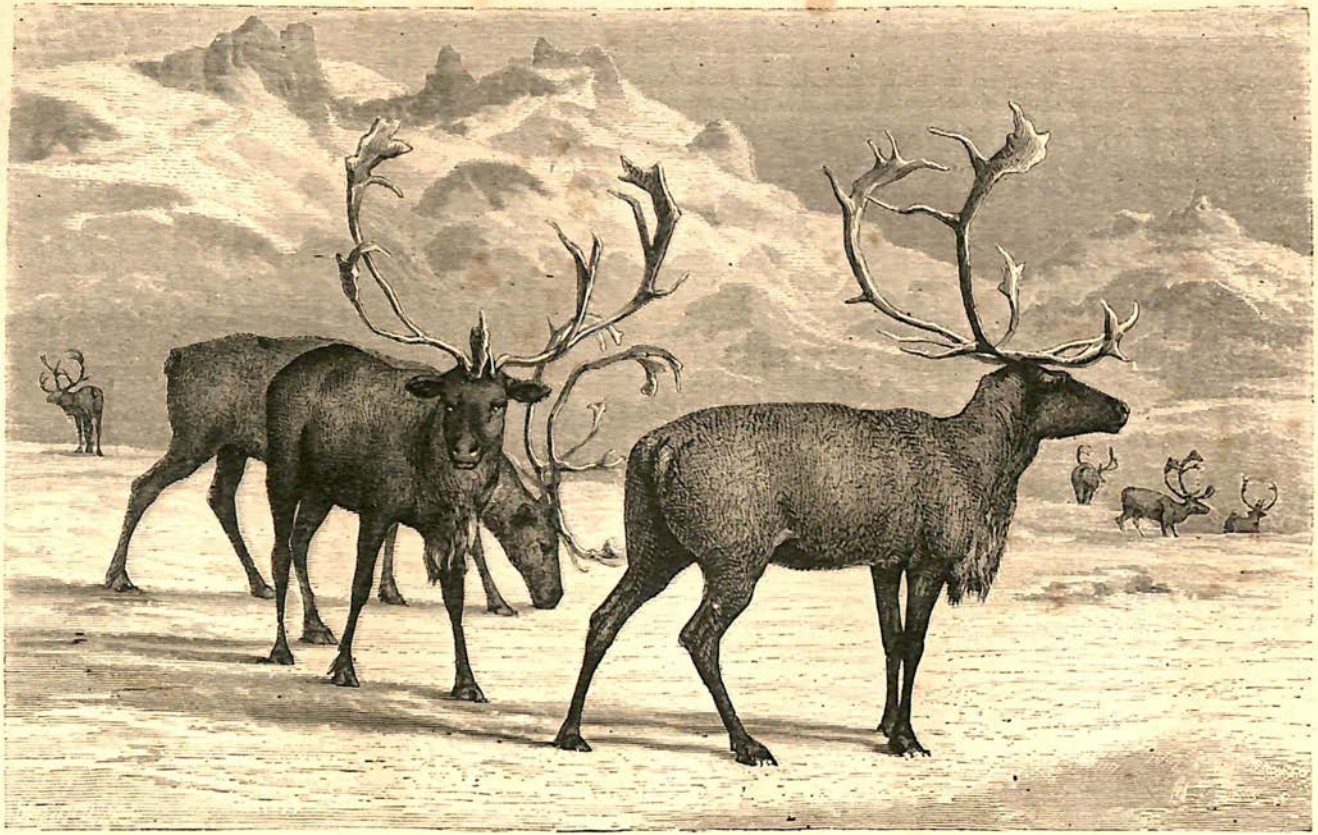
noticed in a kind of pass amongst the rocks the tracks of deer so numerous, we concluded that this must be in the direct course from one feeding ground to another. Here we built up a kind of screen of rough stones and *débris* from the mountain side, as a kind of blind to hide behind in the event of deer passing that way; and though our whalers are expert in the pursuit of their own calling, they so entirely lack the ordinary requirements of sportsmen, in the true sense of the term, we fancied they might, on a pinch like the present, assist in a "drive." Having this object in view, the men were initiated, as far as circumstances would admit, into the mysteries of the art; and though they never had killed a deer before, they entered fully into the scheme. Some of them were posted in the pass, we amongst the number. The others were sent off, with instructions to avoid giving the herd their "wind," and, when at sufficient distance, they were to endeavour to approach within range, when, if the stags became alarmed, they would naturally move off in the direction of the pass and give us the chance we sought. Nothing could have been more successful than the plan, had the old stag towards whom the little herd seemed to run for protection on the first indication of alarm only taken the expected course. He did nothing of the kind; after a rapid survey of the besieged ground the

herd turned tail, literally, and made off in a direction we never contemplated. From our vantage ground we could see the whole proceeding with our glass, and we followed the dusky forms of the herd as they went away at a topping pace down the valley towards some special retreat they were known to frequent. As they go, the men bring their guns to their shoulders to try their luck at a long shot, but all to no purpose; the beasts escape without the loss of an antler tip, and pretty as the sight is to us who are only lookers on at this attempt, it is a disappointment we all equally deplore.

Our observations were not entirely without a purpose. During the chase of the deer we had time to look about us, and as our schooner lay in Widdie Fiord, a harbour on the northern shore, we could see that only a narrow neck of land divided us from Icy Fiord, the point for which shipwrecked sailors in this inhospitable land make, in the hopes of meeting with a ship to take them home; we endeavoured to trace a course from the northern shore, by which escape could be rendered more secure. These valleys, through whose windings the deer wander, may be part of a continuous system, which start from the fiord on the western coast, and lead down to the swampy lowlands where we found the herd. Speculating on these things we return to

report our failure to the ship, and are content to assuage our hunger by appeals to the Australian meat tins, that in our estimation are certainly not composed of venison.

Sportsmen as keen as ourselves may, on reading of deer-stalking in Spitzbergen, be tempted so far in the hope of enjoyment such as we had in their pursuit. To these we would recommend the study of the newest chart of Spitzbergen, and advise them to adopt the precaution of carrying a pocket compass, whose use should be well understood, in the event of getting separated from their party; a watch is of little use, and may, with prudence, be left on board.



REINDEER.

To face page 223.

CHAPTER VIII.

"How shall I admire your heroicke courage, ye marine worthies, beyond all names of worthiness, that neyther dread so long presence or absence of ye sunne; nor those foggy mysts, tempestuous winds, cold blasts, snowes and hayle in the ayre; nor the inequall seas, which might amaze the hearer and amate the beholder—where the *Tritons* and *Neptune's* selfe would quake with chilling feare to behold such monstrous icie ilands, renting themselves with terrour of their own massiness, and disdayning otherwise both the sea's sovereigntie, and the sunne's hottest violence, mustering themselves in those watery plaines where they hold a continual civill warre, and rushing one upon another, make windes and crashing and splitting their congealed armours."—PURCHAS HIS PILGRIMS.

FOR the next two days we devote ourselves to stalking the reindeer. We can see them from the ship, but the ground is totally unsuited for our purpose. There is not a trace of shelter to conceal ourselves in approaching the herd. Driven as it has been for some time by the Norwegians, who have made them wild by constantly shooting them down—in fact, the Norwegians consider our going after deer as an intrusion, and this fact adds to our chagrin, when we return empty-handed to our ship. The third day we haul the schooner at high water on to the beach; as the tide recedes we search for the wound in her side, and we seek in vain. Her injury is quite incurable. Had

there been a hole we might have stopped it, and gone where we pleased; but this hurt was beyond our skill, and we were forced to turn back after all our plans were laid. We look again and again for some damage that may be repaired. We are far on our way, and it seems hard to relinquish our purpose. How can we dare to face the ice in such uncertainty? We ask, and console ourselves by the thought that next season we shall come again into these seas, better prepared to face the difficulties that may present themselves; and we set to work on what we believe to be the weak place where the leak exists. We nail a sealskin, coated with tar and oakum, over the place, and next tide haul her once again on to the sea. The leak is somewhat reduced, and we have a tussle with the ice once more before we return out of the fiord into the open water. The north wind drives the ice up to and beyond us. While we stand waiting to see the effect of the thirty miles of ice which holds us back, we begin to drift down the fiord, following the field as it goes. At one time we are nearly driven on shore by a sudden shift, which threatens to force us back the path we have come. We, therefore, look out a safe anchorage, and starting from thence we wander sometimes for two days away from the ship in quest of game. On such occasions the continual daylight

is of rare advantage to the sportsman. In the dusk of evening or the hours of darkness, under the long shadows of the mountains, the water would freeze; but the cold is never unpleasant, except during a northerly wind. We rest at all hours, and after sufficient sleep we start on whatever occupation we may be engaged upon. To one accustomed to a life of routine the change is rather trying at first, but, after a time, the perfect freedom of action is delicious, and breakfast or dinner is served when breakfast or dinner may be required. Our cook, good, easy man, falls into the humour of the thing, and has for his motto "toujours prêt."

On the seventh, we row about eight miles from the schooner up the fiord to a point inside an island not in the chart; we land, and inspect a square wooden house, which, from its age and exposure to the weather, ought to have been by this time a respectable ruin. Here, owing to the atmosphere, it wore the aspect of a modern structure, simple in detail, twelve feet by eight, having a fireplace of clay and rough stones, with two rough wooden benches for its furniture; a curious cross stands near the door, having upon it in the Russian language a short inscription, the name and date of the last inhabitant. This, and some other buildings in Widdie Bay, belonged to a company of

Russian traders who lived here from year to year; some of their party returned home with their spoils, and brought back such simple requisites as the people needed. They killed and tracked Arctic animals, and became so wedded to their life here, that one of the party, a serf, spent thirty-five years in the islands: only once in eighteen years did he return home. He died at last, and was buried on the island. The others met the same sad fate that has befallen so many of their hardy companions who have braved the winter in these desolate regions. Once when they had assembled together, as was their custom every year, to receive looked-for reliefs and the year's supplies, the expected ship, as she neared the coast, was wrecked, and they were starved to death. Afterwards a Norwegian crew, having escaped from shipwreck, came to the Russian depôt, expecting to find some assistance in their dire distress; then they also found a sad sight to crush out the little hope remaining in them: the newly made graves of the Russian colony, and the dead bodies of the two last men lying in their sleeping-places, told a tale of misery and want, hard to describe in words. Their journal gave the dry details of each day's doings; gradually its pages began to tell the hopes and fears that racked the brains of the expectant crew. The patient waiting for relief that never came; the daily

decrease of their rations, never abundant at any time; the approach of scurvy, vile servant to want of hope and biting hunger. We should doubt, if it were said that they gave way without a manful struggle; the men who come here are not prone to that. Other evidence is here to prove that men, when all hope of aid from without fails them, have still resources they are not slow to practise; a little crew was wrecked close by, and their ammunition having failed them they set about to construct harpoons of such scraps of bone as they picked up along the shore, and contrived traps made out of drift-wood, resolved to support themselves by such food as they were able to capture in this way until a vessel came their way; six long years' after, four out of five of the men went on board a sealing-ship that opportunely was passing by; nor did they go from their captivity empty-handed, they were enriched by their stock of accumulated skins collected during the time of their imprisonment.

We saw the remains of traps along the shores of Widdie Bay—wooden cages constructed with bits of drift-wood. The huts, also, we were careful not to injure, never knowing how soon they may be required for the reception of some fellow-seaman. We ourselves had some reason to be thankful for enjoying such shelter as they offered. Once we got well soaked in

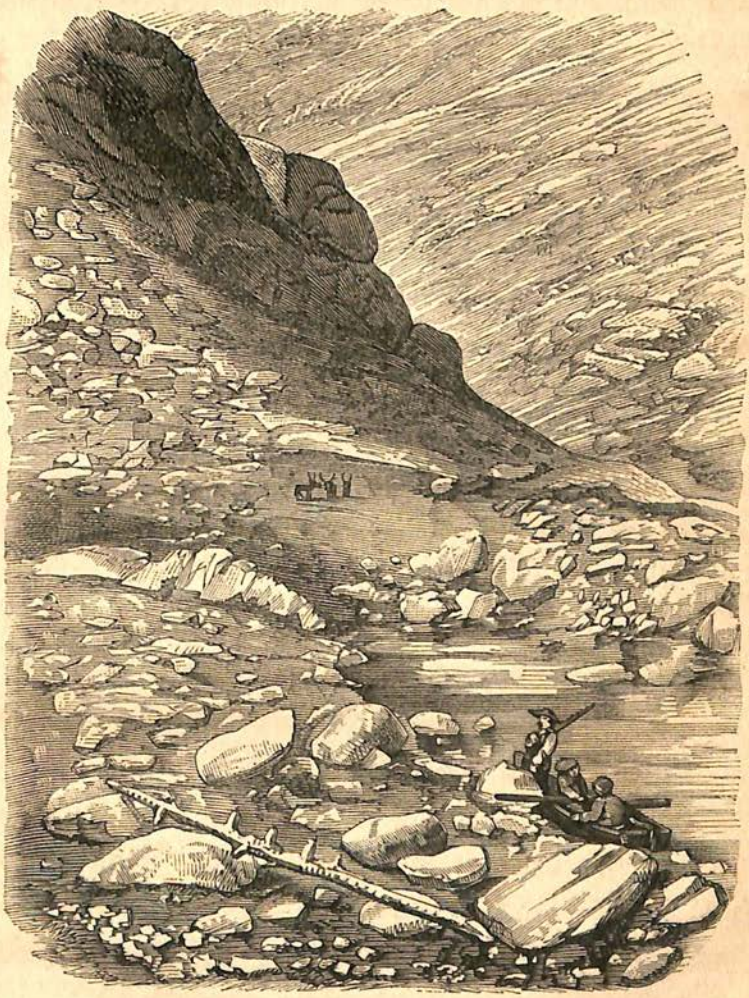
crossing an estuary, and after stopping sundry holes in the walls with moss, we lit a fire, broiled some deer, and, while our clothes dried at the fire we had made, we sat and smoked a pipe in comparative comfort.

The Norwegians make poor attempts at wintering in the north; they are not equal to the difficulties, and of late years have given it up as altogether hopeless.

The reindeer in Spitzbergen have a reputation for being tame and almost indifferent to the coming of the sportsman. However they may have comported themselves in former times we can form no opinion, but with the exception of such rare opportunities as the scanty cover may afford, or rocky places give the sportsman, we found these deer as difficult to approach as the red or fallow deer in other parts of Europe. During the eighteen days we spent in the pursuit of reindeer the first three days went for nothing; after that we succeeded in killing thirty-six beasties, and our stock exceeding our requirements, my worthy companion was able to make presents to the Norwegians, who seemed glad of this accession to their stores so far away from home.

We landed in quest of geese one day, and on our way to the beautiful lakes where they harboured we saw a deer, but did not shoot him, fearing to disturb the watchful birds we were in search of. We had no suc-

cess in this, at all times difficult, sport, but we carried off some young birds of the year which were capital eat-

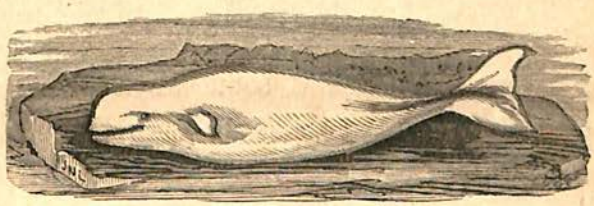


ing. Returning, our friend wanders a little out of the way, and some deer are seen in the distance by us ; we

wave a handkerchief to attract his attention, and we see by our glasses that he also has discovered the deer. We act in concert, our object being to get closer to the herd and keep them well between us. The stag disappears from view, and is soon again under cover of a rock; we make for a ravine and run along its rugged side to get within range: we fire, and miss. Not so our experienced comrade; he knocks over the beast he shot at. Our friend carries a little Henry-Richard's rifle; we are armed with a short Enfield, whose trajectory is too great for this kind of sport, and we resolve to use an express rifle for the future; it is certainly heavier to carry, but for a range of 180 yards as perfect a tool as a man can well find. We have been walking for six hours; it is 3 o'clock A.M. We do not conceal the fact that we have enough of it, with seven miles to pull home to the schooner to conclude; we insist we have had pleasure enough for one day, and the point is conceded without further parley. Starting again, after a few hours' rest, in pursuit of deer, we have varying success; then we return to the boat to find our man gone in pursuit of deer himself; we wait patiently for his return; piling up a log of drift-wood upon the fire we go to sleep upon the beach, and on his arrival we propose a fresh excursion, but we find Eddy worn out with fatigue, at 8 A.M., so we return

on board. In this way the time goes by, there being nothing but bodily fatigue to induce one to desist from labour. We lose count of time, and grow confused as to the proper ordering of a day's occupation.

The 13th of August has come, and after a short council it is decided to try again for the north, and if we are unequal to the struggle, owing to the unhealed wound in our ship's side, to sail south once more. In the afternoon we killed a white whale (*Beluga catodon*). These little fellows are from ten to sixteen feet



in length, and give a ton of oil to every six whales. The hides are used for making a fine boot leather, worn by the Norwegian ladies, but our people rarely bring home the skin, as there is no suitable way for dressing it, and no market for it.

The white whale is beyond all comparison, says Brown, so far as its importance to the Greenlanders and Eskimo is concerned, *the* whale of Greenland. Like the narwhal, it is indigenous, but it is only seen on the coast of Danish Greenland during the winter months,

leaving the coast south of 72 deg. N. lat. in June, and roaming about at the head of Baffin's Bay and the western shores of the strait during the summer. In October it is seen to go west, not south, but in winter can be seen in company with the narwhal, at the broken places in the ice. Its geographical range may be said to be the same as the narwhal's, and during the summer months corresponds with that of the right whale, of which it is looked upon as the precursor. It, however, wanders further south than to 63 deg. N. lat., being quite common in the St. Lawrence River. It feeds on crustacea, fish, and cephalapoda; but in the stomach is generally found some sand. The sailors often jocularly remark, in reference to this, that the *Kelelluak* takes in ballast.

The males and females swim together in the same flock, and do not separate, as has been stated. Their blast is not unmusical, and when under water they emit a peculiar whistling sound, which might be mistaken for the whistle of a bird. And on this account the whalers often call them sea-canaries.

The two Norwegian sloops are occupied in netting these white whales close by, and we go to see the sport. Their costly nets have meshes six inches square, made of cod line, seven fathoms deep, and about 800 fathoms long. One end is made fast to the

REINDEER SEEN IN PASS. *Page* 232.

shore, the other is held by a boat anchored at right angles with the shore, then to the sloop in a line with it. As the tide rises the whales come swimming up the estuary, and a boat having the spare net is hauled by a windlass towards the land; in this way the whales are caught in a three-sided net, the shore forming the fourth side. A smaller, but strong, drag-net is used within this park to enclose the herd, and some men in boats pursue the flock towards the strand, harpooning all they can. Dragged into shallow water, the rest fall an easy prey; but the cost of the nets is a heavy item of expense, owing to their great size and superior make. The scene is exciting enough, and the result a complete success. They obtained seventy-eight whales in one haul. But this year the fishermen had poor sport generally, and they attribute their want of better fortune to the fact that all the northern shores of Spitzbergen have been blocked with ice this year.

CHAPTER IX.

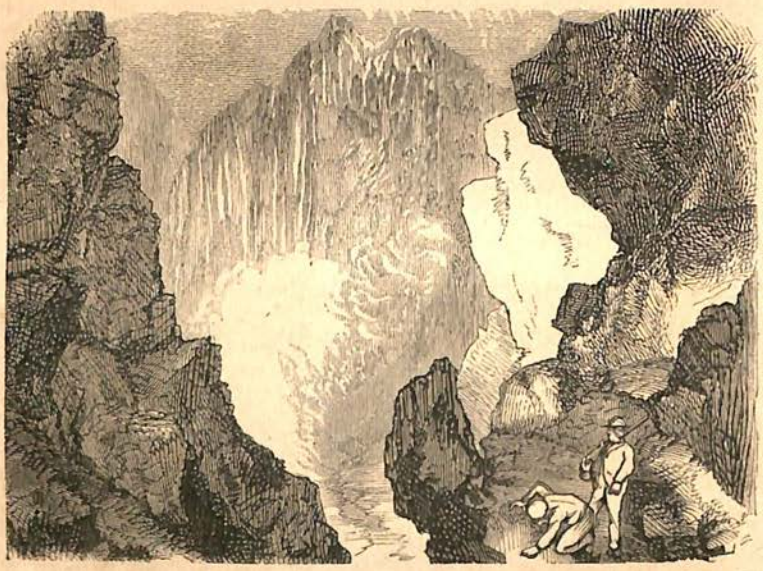
'Still pressing on beyond Tornea's Lake,
And Hecla, flaming through a waste of snow,
And farthest Greenland to the Pole itself,
Where, failing gradual, life at length goes out,
The Muse expands her solitary flight."

THOMSON.

Now we go seeking for deer up a long valley, accompanied by one of the men; we come to a rapid river, and find a herd of eighteen reindeer on the opposite side. Going up to the valley end we look down upon a scene of rare beauty, almost of enchantment. Spread out beneath us we see three large lakes fed by a mighty glacier which flows out close by. On either hand the scene is shut in by two ranges of steep and rugged mountains. We come upon more deer: two fine stags at one place, a small herd at another. We successfully stalk a single stag, but are too tired to attempt to carry it to the boats, some two miles off. We get back at 2 A.M. and mention our experience. Our friend at once starts in pursuit, while we promise to join him after a couple of hours' rest; but the ice shift-

ing, our schooner is carried to the northward. The noise and confusion, carrying warps out, raising of chains, and other severe work on deck, banishes sleep, and as soon as we can we land, resolved to join our friend, who is about five miles away. We take two men with us; they think we are right in attempting to make a short cut by descending one side of a steep ravine, which lies directly in our path, and after crossing a river which flows in the low ground, to ascend the opposite side of the ravine and so overtake the party we are in pursuit of. The steep side of the ravine is about five hundred feet in descent, very perpendicular, and by no means easy-looking. We do not stop to weigh the propriety of going out of our way to the head of the valley, so we commence our journey downwards. At first we are compelled to return, with difficulty, from some very false starts we have made; but as we have resolved, we go on, taking in as we go the charming details of the prospect. Great rugged rocks jut out from the sides on either hand;

leading to them we notice ledges of rock in layers, all tending downwards; beneath, we see the mountain torrent boiling in its narrow bed as it rushes to the sea. The opposite side seems no less difficult than that we are striving with, and the valley is seen to terminate abruptly at some distance above. We let ourselves down with great care, holding on to every



little projecting stone until we reach a secure boulder stone some distance down. Here we are brought to a standstill, and looking up we find, to our dismay, we cannot return. The rocks so overhang it would be impossible. Our faces wear a puzzled look. At length Hayward volunteers to be lowered by our rifle belts to

a footing he sees below. Arrived there, we call out, sailor-like, "Stand from under," and we let him go. He lands safely, luckily for us. Now Roberts disappears over the ledge, then the rifles and our companion's lunch. Roberts now mounts on Hayward's shoulders, and we slip down first to one, then to the other man. Again we stand together in as difficult a position as before. After that comes the stream, and beyond lies the rugged ascent of the ravine. Again Hayward goes first, "sweep fashion," he calls it. Being a slender, active man he finds little difficulty apparently. With assistance we follow, and we eventually cross the stream, with no other hurt than a few bruises. Once over we find the trial of the ascent less than we expected, and we hasten forward with all

speed, fearing to lose our party. Several shots had already been fired to inform us of their whereabouts, but these we did not hear; and when at length we came up with the others, they had given up the hope of meeting us and were returning to the schooner. We had decided to walk towards the deer killed during the previous night, concluding that a visit would be paid to that point, and we are so far successful. The luncheon we carried proved most acceptable. Coasting along the bay, we make up a party to stalk other deer we have seen to-day, and our hunt has proved more successful than we had looked for. We are so rich now we can share with a neighbour from our larder. We go again in search of three large stags not accounted for, and this time we take the M. H. express rifle. Its heavy weight, with all our practice, tells against our muscular structure, and while we write, we feel the effects of carrying this useful gun, in certain pains about the hollow of our back; yet we killed all three deer before returning on board. The details of the sport, various and full of interest as they ever will be to ourselves, might cause weariness to the reader; suffice it to say, then, that the second and third stags were shot in full view of the crew, who saw each scene in the act, and as the last stag rolled over dead from the shot, the

men raised a hearty cheer. There is a lake near Albert Dirk's Bay marked "Salmon" in the chart, and though we have not much faith in the chart itself, we are anxious, for sake of change, to combine fish with our venison and tender gosling dishes; we make sail in that direction. The ice steadily opposes itself to our wishes —that bugbear of all our voyage is driving down upon this side of the bay. A Norwegian sloop is in company with us, and her skipper seems rather anxious; once or twice he has hailed in broken English, and at last he runs up a flag and bears away. We beat backwards and forwards. After half an hour's anxious tacking about to and fro, like some newly caught animal in a cage, we manage to escape through some lucky chance, just as the ice had almost caught us, and we cross to the opposite side of the bay where our Norwegian has already cast anchor under the lee of the land. Her captain offered to help us with a gift of some hard wood—he called it "Hekey wood" — to repair our broken stem; but we had no experienced hands on board to attempt the work, and declined. He explained the custom of hoisting a flag to signal that the ice was open ahead, in order to warn his less lucky companion of the chance,—a signal we did not comprehend at the time.

We made yet another hunting party for the pursuit

of the deer, and shot a stag with the velvet still on his horns. At this early season the horns look handsomer than they are later on, when the dry antlers are divested of this covering. As we go in pursuit of our game, we see another herd too far away from us, and yet if seen by our companions within easy reach of them by stalking. We make a sign which is fortunately understood, and our companion sends on his man, who creeps behind some rocks and so gets well on to his mark. The frightened stag runs off, and is rolled over by that clever marksman. A second deer refused to leave his dead companion; while he stood undecided what to do, he gave the sailor the opportunity of firing two shots at him, before a well-directed bullet rolled him over.

Then we had a laborious four hours after some deer before we could stalk them near enough for a shot, but succeeded in the end in bagging two deer with a right and left shot. To show the attachment of these beasts to their fellows, we may mention that during the previous year Mr. Leigh Smith, sailing in Hinlopen Straits, shot a large stag, but missed or could not get near its companion; as they were a long way from the ship, and the ground was very swampy to walk over, he had the head and horns removed, and brought along with him to his schooner. They saw the survivor go to the

headless remains, and then follow the party to the ship, sniffing at the air laden with the odour of the departed one. As it lingered on the shore, a man quietly landed from the boat and shot it.

Here was another instance out of many we witnessed on this journey of the affection of these poor, solitary creatures, leading them even to inevitable death.

There is some dispute respecting the identity of the American and European reindeer, as to whether they are the same animal or only varieties. That there is some distinction we are satisfied, having compared the massive horns we brought home with others we have seen from Greenland and America.

It may be that the fly, which is not only a torment to the European reindeer, but is an actual injury to the skin its grub has taken up its abode in, is absent from these higher latitudes, and the comparative freedom from this scourge may be in some remote way the cause of its finer and better development.

Dr. Hayes fed his party luxuriously on reindeer all the winter at Port Foulke, in Smith's Sound, not many miles from where Kane's party almost starved a few years before. Behind Holsteenberg are valleys full of reindeer; and Mr. Brown heard tales of people climbing the hills in that vicinity and looking down into

glens where the reindeer were so numerous that they might be supposed to be the herds of a wealthy Laplander. Ten thousand skins were shipped from that port some years ago. They are slaughtered indiscriminately by the natives, these improvident people, in nine cases out of ten, leaving the hides and flesh, and only taking the tongues. They are bad enough shots, and the Danish traders supply them with powder at less than prime cost—viz., 36 skillings, or 9*d.*, per lb., with a view to increase the produce of the hunt; but this ammunition is wasted in a most reckless manner.

On the way to and from these hunts up the fjords, the Danes are filled with the savage desire to kill every living thing. Ducks are shot and left lying; or, if they are very hungry, they will tear off the "titbits." A ptarmigan will be shot sitting on its eggs, and the ball cut out of its body, to be used again in this murderous sport. There is no necessity for it; for at this time they are abundantly supplied with food, even to excess. It is, however, the season for sport and fun, looked forward to by the natives of Greenland, much in the same light as we do to our grouse-shooting or deer-stalking, and is about as profitable to all parties concerned. In order to pursue this sport, they leave the more lucrative seal-fishery,

and neglect to lay in a winter supply of food; so that when the "banyan" days come they bitterly repent their folly, and weary for the bleached carcases up the frozen fjords.

Notwithstanding this, regularly as the season comes round they are off again to the shooting from far and near, and repeat the same improvident course; nor, if they like it, has anybody a right to complain. In all verity enjoyments few enough fall to the lot of these hyperborean hunters. However, the result of this indiscriminate slaughter is now being felt in the decrease of the reindeer in many parts where they were once common. They are no longer found on Disco Island as in the days of Cranz and Fabricius. Indeed there are now very few shot in Mid-Greenland, and many of the natives are giving up the hunt for them altogether.

Holsteenberg, another Greenland settlement, is a favourite locality; the hunting-ground is behind the large inlets where the ice lies far back, and where the land most free from the ice has been found. The animal cannot travel well on ice, and the difficulty of transporting its food on long journeys is another obstacle to its use in Arctic travel. The Eskimo make long journeys over the frozen sea along the coasts of Greenland in the winter with dog, in preference to the reindeer-

sledges. Deer meat is very good if eaten soon after the animal has been killed, or again at some long interval afterwards. Once the flesh sets and becomes rigid it is not near so toothsome and nutritious. The Spitzbergen reindeer certainly offers the best meat; and the newly-discovered land to the eastward of Mid-Spitzbergen is reported to have reindeer of a quality still better in point of flavour and condition to those we have been killing. This discovery of new land gives additional zest to exploration; the north-east point of this new region is in Lat. 78° 8′ N. and Long. 50° 15′ E. Altman had touched here previously to Johnsen, and his three islands are now found to be but one vast land with a coastline of forty-five miles. The sea in the vicinity was free from ice, except on its northern shores, and on the island no snow-field of any extent was observed, and only one glacier, and the shores abounded with immense quantities of saddle-back seals (*P. Grœnlandicus*). The whole coast to the height of 20 feet, and extending 100 feet inland, was covered with quantities of driftwood, most probably washed out of the mouths of Siberian rivers.

The tallow of a large reindeer will weigh from eight to twelve pounds; the tongues are first cut out after the deer is killed, and in some places where the difficulty of land-carriage is not to be overcome,

the tongue alone is brought away. In this way the waste of deer meat is enormous, and it is so nutritious it is very strange that some means of preserving it on the spot for exportation has not been devised: this meat would surely be profitable in these days, when the flesh of the Australian kangaroo is a marketable article in England at the present time. We landed with the determination of examining and making a thorough exploration of the land immediately abreast of the position of our schooner, our opinion at the time being that the magnificent valley we could see would be found to wind in a gentle course, under some high and very rugged mountains, whose lofty sides rose precipitously from the bay. In our intended land-survey we had some prospect also of falling in with some herd of reindeer, the place having all the appearance of affording the animals sufficient inducement to attract them to it.

Our party on this occasion was a large one, the men, whenever there seemed any likelihood of sport on foot, being evidently eager to be permitted to join in the adventure; and my companion, at all times pleased to afford them whatever enjoyment they might join in whenever the duties on board the ship would allow of their absence, took with him whatever hands could be spared. It was this enjoyment of the men that

defeated whatever chance of sport we might otherwise have had; for their hearty acclamations, engendered by the glorious weather we were exulting in, rose to fever heat as they set out, and manifested itself in good-humoured laughter and jolly exclamations as they advanced, so that the deer would have been dull indeed had they remained anywhere in our immediate neighbourhood. So we wandered along in happy disregard of order and moderation, and as we passed under the great masses of rock, which seemed barely suspended from the grand cliffs to which they clung, we could not help looking up with a kind of dread lest they might in some way become detached from their resting-places, and come tumbling down upon us; nor were our fears without reason. The sun had melted away the snow and ice which during the winter had clung to them, and the thawing water had carried away with it much of the earth and detritus, which to some extent had cemented these masses to the surface on which they clung. By degrees we were enabled to leave the dangerous propinquity of these cliffs, and we gradually made our way out on to the charming valley. The little plateaux were beautifully green, with scanty herbage, eked out with rank moss, whose surface was spangled over with many flowering plants, whose gay bloom gave a peculiar charm to the

otherwise desolate-looking soil. The sight of fresh flowers starting into life under the influence of a bright northern sun in the space of one short month, with a temperature whose greatest power raises the heat of the surface from 30° to one rarely, if ever, over 50°, must be seen in order to comprehend the enjoyment it produces.

Then, gradually ascending, we rose above the rain-

cloud, and onwards and upwards through the mist; on and on until we got into a clear atmosphere above, where we found a totally different climate to that we had passed through in the valley below, its effects upon us being evident in the cheerful countenances of all our party. Fatigue had no depressing influence upon us up here. Such a thing as care was left far down in the mists of the valley. Nature in her welcome

gave fresh vigour to our limbs, and the muscles, beginning to flag with the constant strain upon them up to this point, gained fresh strength as we toiled up the steep mountain side. Our lungs, renewed with the wholesome draught, could help us upwards, we thought for ever. Time, the bore to all enjoyment, at last began to tell on our limited powers, some of the boasters being the first to cry out. In pity to these, we halt and hold a council. It would be a grave reproach to us, having set out with so desirable an object, to return back defeated, and there in front of us, at but a trifling distance apparently, stands the summit of the peaks above, whose crest we had resolved to reach. Once there, we have but to look in any direction, and resolve any doubts we may have as to the geography of the region.

We felt bound to go on and explore. The distance seemed so trifling, that any labour we might endure in gaining the top was nothing in comparison with the disgrace of failure. We resolved to push on, and invited some one willing to go as a companion. Magnus at once volunteered, and our arrangements were soon made. The others were to return at once to the schooner, while we two would attempt the ascent. If we gained it, we would act as circumstances would direct, and return by some other route. All the biscuits and slices

of congealed soup, no longer wánted by the returning party, were quickly collected for our own use in case of any emergencies we could not foresee; and after a kind adieu to our companions, we once more faced the mountain. We had no idea of the work cut out for us, or we also might then have gone back.

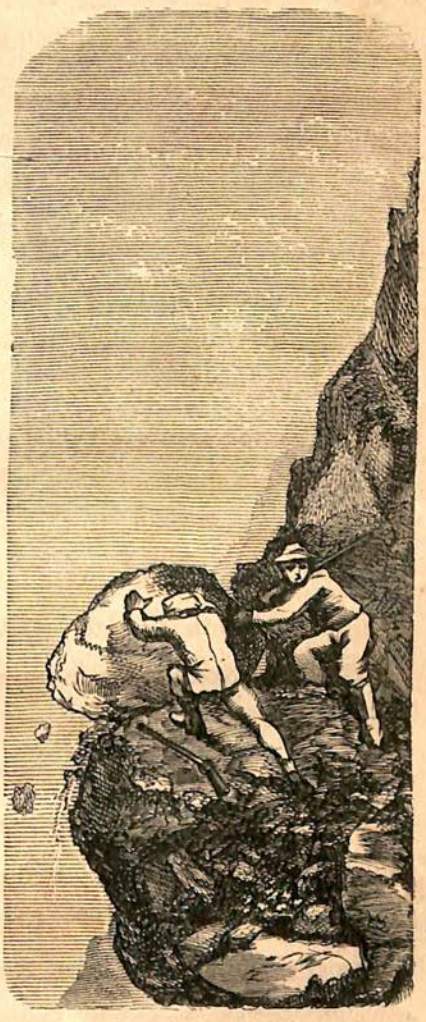
We had arrived at the limit of vegetation, and began the laborious task of scrambling with uncertain foot-hold upon the bare mountain side amongst rough and crumbling shale and sharp fractured stone. Gradually the ascent became difficult, as the slippery surface crumbled away beneath our weight, and went rushing down the mountain side. Now we came upon a glacier in the shade of the southern crests and shady nooks concealed from the direct rays of the sun by overhanging and steep rocks. The ice, though proverbially treacherous to walk upon, was a welcome change to us, after the loose shingle, so difficult to travel over. A mountain stream, having its origin far up in the mountain, came racing down; in some places it spread itself over the glacier, in others it went thundering down the mouths of yawning caverns in the ice, and these great pits looked far too terrible to venture near. My good friend Magnus, who owns a farm in the Shetlands, and has gained a reputation for his wonderful feats of cliff-climbing amongst his hardy

countrymen, men noted for deeds of daring when engaged in egg-collecting along the almost inaccessible cliffs that fringe their home, is not without some slight apprehension here.

Still we are both resolved, and the air is cold up here, and the atmosphere is laden with frost, but we do not feel it; on the contrary, we are melting with the heat induced by our exertion in climbing.

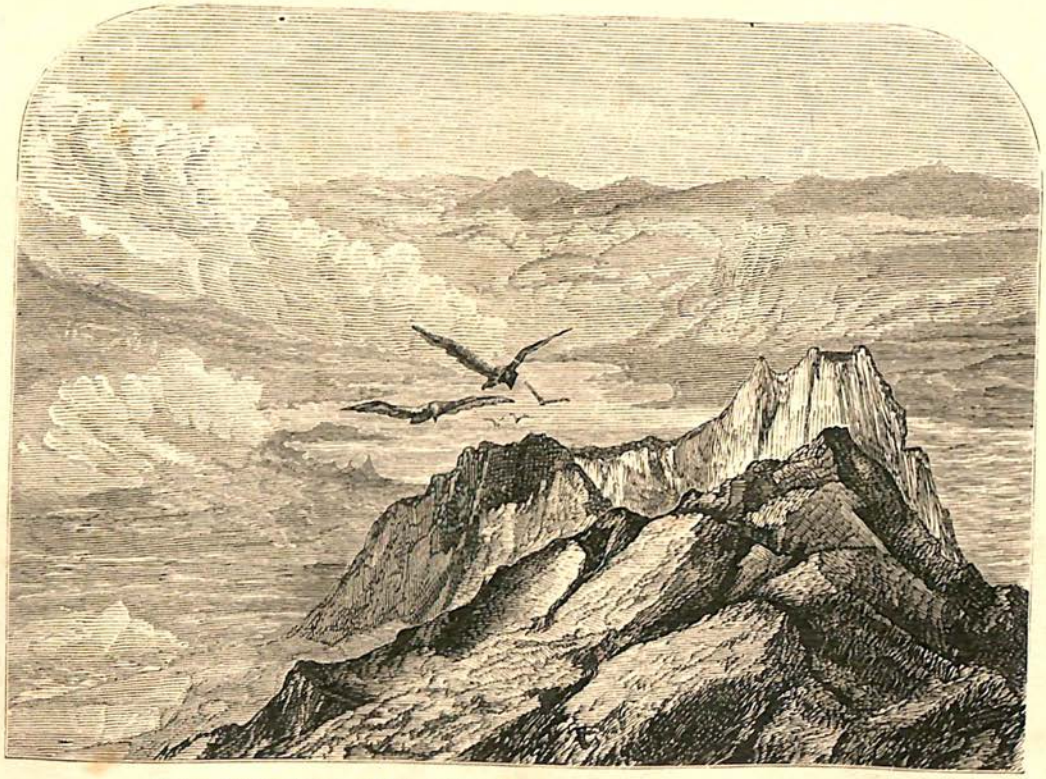
Far above us we see a tempting ridge projecting somewhat, and once there, we agree in thinking we have gained our object. To it we press on with all the zeal we can command. We press the stocks of our rifles into the shingle, and in this way make considerable progress. Coming to an enormous boulder that stands on the very face of the mountain, and derives its slender support from some little heap of débris, and perhaps a slightly projecting rock, we stop a moment to wonder at its evident insecurity. The winter frost, acting on the water collected in little pools and on the saturated soil, eats away what formerly was the support of these almost detached blocks, so that at last they seem to hang by a thread. It is too much for the boy-like feelings of Magnus. Out it must go, the prisoner must be set free; and he settles to work with a will. Soon the support is undermined,

and a slight push is all that is needed to liberate the boulderstone. We push, and down, down the steep mountain side the enormous mass literally thunders as it crashes along. The echo from all sides raised by its frightful noise reverberates through the mountain. We stand for a single moment and gaze in wonder at the falling mass, but the vibration caused by our imprudent act might have proved a serious difficulty for us. Above us, on all sides, the rough projecting masses of rock begin to descend in turn, and as they come rattling down we fear their accelerated speed will soon sweep us away with the avalanche of stones now set rolling.



We dared not attempt to descend: such an attempt was certain to end fatally. What could we do? In a moment we were resolved. Close by was a glacier; once on that we would be safe. Some way—we know no way of explaining how—we got there in time to escape from the pressing danger, and in time to watch the flight of missiles shot out by the mountain. It resembled in sound a continued cannonade, while the din lasted; and then the noise and clatter as suddenly stopped, and the old silence once more reigned on the mountain side—a silence only disturbed by the trickling noise of the mountain stream.

Now we determined to advance in silence; not a word was spoken. If we required to communicate our wishes we made signs to one another, using the greatest caution not to disturb the mountain side again. Following in single file, one track served for both. Here we laboured upwards with difficulty. Once, when we found our progress impeded by a projecting ledge, we were forced to go down a little way, and going down even a little was a work of severe toil. After a six hours' climb, we sit quietly down for a short rest, and to eat a morsel. A draught of the cold pure water was to us most deliciously refreshing. Falling in a revèrie, I pull unconsciously a bit of paper from my pocket, stored as it is with broken



VIEW FROM THE PEAK BETWEEN ICY FIORD AND WIDDIE BAY. *Page 252.*

biscuit and tobacco. It is a letter. How long it has lain there, or who it is intended for, we cannot imagine. Long since the envelope has been frayed away, and become tattered; the address, if ever it had any, is no longer decipherable. The note it contained is safe enough, but somewhat torn. It began, "My dearest," and wound up with "from your own fond love." What else it contained we must not say, but it brought back tender thoughts of home and friends, and we felt it might have been for our reading, and we put it away carefully, and once more turned to our task. One long hour's toil, and at last we sat astride the high peak. The enchantment of the scene forbids any attempt at description; and the vague feeling of insecurity, as we looked down from our giddy height upon the steep mountain side, made us rather think of our safety than linger there with so much danger pressing around us. The cold, too, which we could not feel in our ascent, now began to warn us that if it once got possession of our limbs, it could not easily be shaken off, as we had learned by experience. So, without remaining one minute longer than the time demanded while we satisfied ourselves as to the problem that brought us there, we dismounted, and began slowly to pick our downward steps. The steep places on a mountain of this cha-

racter are exceedingly difficult to descend, but we overcame the difficulties, and arrived at the schooner in time to see all hands busily at work. For during our absence the ice had shifted, and, drifting down and across the schooner's bows, her position had at once to be altered, and to do this all hands had been engaged upon her during the night. We were glad, then, to find that good fellow the cook had not forgotten us —far from it. "It's steaming 'ot, sir! Been waiting for you, sir, for the last five hours!"

CHAPTER X.

"Jacet extra sidera Tellus
Extra anni solisque vias."

We saw no foxes here; in most of the other valleys we saw a few, but on no occasion could we secure a specimen. At this season the reindeer, finding food abundant, grow very fat, and their condition is at its best; roast haunch of venison, served up hot five hours after the stag has fallen, is food of the highest quality. And a neighbouring Russian hut, with its scant appliances, quickly serves us for our banquet-hall; drift-wood abounds. The vegetation on which the deer fattens is abundant, and is becoming dry and nutritious food for them, but in the winter here, when supplies grow short, the deer must suffer greatly; it serves us as well for fuel. We must follow the course of the ice day by day, as some good result may come from the record of our observations here. We found the wind shifting again to the north on the 18th of August, and bringing down upon us the ice, so we moved to the southward of the point. Here we lay one whole day, and then growing weary of this perpetual buffeting with the ice, we make

sail and work our way out of the bay, keeping well to the west side, where the water is pretty free from our opponent. Once outside, the sea looks tempting, and it again sets us thinking of a northerly run, late as the season is. But before we have quite resolved, the ice is once more about us, and we run from it to Red Bay, the ice being driven by a north-westerly

breeze. Here we anchored under the lee of a "point," and had the misfortune to break our anchor. The ice coming down so fast upon us we could not hold our own against it without much labour, in which we lost two hawsers we had just been using as warps, our boat was capsized, and little David nearly drowned; we haul in alongside an iceberg lying aground in

shore, and protected by it we rest secure. The sloop joined us here, and soon after two steamers put in, followed by two more fishing craft. We form quite a fleet resting here for safety, and we pass our time inquiring from the men what sport they have had during the season.

The ice to them had been equally unfriendly with ourselves; the sport consequently was poor. The northern coast being so much obstructed, but few white whales had been captured, and the men had a gloomy prospect for the coming winter, depending, as they did, upon the full stores they expected to bring home, out of which their share in the venture would be paid.

During our short acquaintance with these foreign seamen we learned one fact worth knowing; soap is by them considered an expensive luxury, and the gift of a morsel was esteemed as an exceeding great favour. The price of soap in Norway places that necessary article quite out of the reach of most poor people, and we need not dilate on the want of it amongst men not particularly careful in their persons, packed so closely in their poorly provided ships. These ships themselves are small, and ill-contrived for Arctic navigation; built of their native fir, the timber is sometimes made more capable of resisting ice by the addition of a

few sheets of thin iron; never intending to go far away from the open water, they always hope to find oil-bearing animals to the south-west and north of Spitzbergen. They have little to fear in venturing into these fishing-grounds, always depending on their skill to escape from threatened danger. Once inside the ice, they coast along the shores during the fishing season, and run back at its close without much risk. It is only through a complication of disasters they at times get caught in the ice, or get nipped between two ice-fields. They manifest great skill in dealing with the ice in such emergencies, and some of them display a coolness and judgment which is most marvellous to one looking on. The ice is so buoyant, the least pressure in the right direction often diverts enormous masses of congealed water, whether in the shape of floes or pseudo-bergs. They rig their craft with a square sail, which is of great value in moments of difficulty, as by its aid they can back out of an opening readily; they generally have a mizen-mast and sail in addition. There are usually nine to seventeen men on board their boats of from forty tons, provided with accommodation for the reception of what oil they may secure.

The steamers are of the oldest pattern. None of the modern appliances, now invariably found in boats even

KING'S BAY.

cheaply fitted, by which greater speed is attainable, or the consumption of a less quantity of fuel is secured, are to be found on board the Norwegian steam whalers. Their stowage also is very defective, and this involves the additional expense of a tender, generally a sailing craft in tow. They creep along rather than steam, and are totally useless even for the purpose they fill at the present time. A steamer of this kind, home-built, with vertical engines of the old pattern, making its fussy way over the sea, is a curious addition to the Arctic landscape. The slow rate is preposterous; the dark volume of filthy smoke rolling out, and the noise of her engines fretting and fuming as they plod along fill us with pity for the backwardness of the people who are forced to remain content with such old-fashioned appliances in this age of improvements.

We sailed into King's Bay and anchored in view of the glacier, which shares in interest with the rare and beautiful marble found here by the few visitors who make their way so far north. We climbed amongst the cliffs in search of specimens, and in one place, where the rocks are hollowed out into a lofty cavern with a current of pure water flowing along its bottom, we found some charming bits of pure white stone curiously veined with streaks of red; specimens of these we carried away with us.

The glacier next attracted our attention; its vast proportions filled the mind with awe. The whole of the upper part of the harbour is occupied with this imposing object. As we gazed on the novel scene, a bottle-nose whale suddenly presented himself in the waters close by, and the men at once gave chase; with varying fortune they pursued him over the sea, and at length, after seven hours' hard pull, they were forced to desist from the vain pursuit. We landed in the evening, if that can be called landing, when the boat can only touch the foundations of some frowning fortress whose lofty walls rise abruptly from the waves.

Here we scrambled up the steep sides whose every ledge and "coigne of vantage" was occupied with flocks of sea fowl. Flocks, say rather countless myriads of spectators in some vast arena. We watched them for a long time, and their attitude resembled closely a crowd of spectators looking on at some spectacle; the old and the young together chattering away as if they had one common purpose. Near by was a patch of low land running inland, and the ground was everywhere broken up by foxes in search of food of some kind. What its nature might have been we could not detect; worms we hardly think exist, for there was no sign of life of that kind, and the scattered blocks of timber, bored and pierced in all directions with some sea-worm,

were tenantless, although it was the warm summer time; and had they ever lived in these latitudes we should have certainly found them when the wood was being split for firewood.

Here it was we saw those northern geese called by the Norwegians "rein-geese." We had ascended a steep, rocky ledge of rocks, 800 feet above the sea level; clambering and creeping by turns we scaled the rugged mountain wall; slowly we made our ascent to the steep brow of the crags, and as soon as we mastered the height we found we were on a level with the top, near to the edge of a deep blue lake, the surface of which was as smooth as a mirror. On it were reposing a number of large pure white geese, resting undisturbed in the awful solitude. Our sudden appearance was a warning of a danger they were not slow in avoiding; rapidly they rose from the margin of the water and flew towards us, making for the open sea. We quickly recovered from the surprise the unexpected vision of these birds threw us into, but in our haste we fired, without reflecting that the birds would fall into the sea if killed or wounded; and so it happened—our two birds killed in an easy shot were lost to us. So ended the solitary opportunity we had during the voyage of securing specimens of the rare snow goose of Spitz-

bergen. Turning to look seaward, a splendid scene repaid us somewhat for our regret at the careless waste of life. Our eyes wandered at will over the vast sea, where only a few blocks of ice lay scattered on its surface; beyond these the ice-fields were spread so far as to seem limitless, while the peculiar Arctic sky lent a charm to the whole it is impossible to describe. We sat and watched the many curious features presented by the unusual prospect, and to us it realized an entirely new kind of enjoyment, which we can only compare to a feeling of profound satisfaction and relief.

We returned from our excursion to the shore. We shot a fox. Start not, my hunting friends! to us the fox is as sacred as to yourselves. Our fox was not russet red; he was a decidedly blue fox, and blue foxes may be shot with perfect propriety. Our blue fox was to us a perfect treasure; white foxes, brown foxes, and even black foxes abound in Spitzbergen; but a little blue fellow was worth bagging, and we carried him gaily to the boat. As we were stepping on board, a blackish-coloured fox, closely resembling the surrounding objects seen in the dusk of evening, crept slyly after us. We could not make him out, however, and we gave up the pursuit. The sailors had seen two black foxes in our absence, which appeared to them to be as large as good-sized retriever dogs. For three days we

remained here in hopes of adding to our stock of oil, the sea being rather noted for its whales outside Prince Charles Island, but on the fourth we bore up for the fiord, having had no chance of gain.

Here a party of Swedes have entered into a curious speculation. Agriculturalists in England and elsewhere having once benefited by the application of guano to the soil, seem in nowise inclined to forego the gain it brings. The sea coasts and rocky islands, the cliffs and coral reefs of the world, are ransacked in search of the precious stimulant to vegetation, and the homes of countless birds we have seen cannot be far removed from deposits the farmer covets. So, here also have come the guano-hunters, and having prospected, they have settled to the work; a hut large enough to shelter the gang of diggers has been constructed near the shore, and all the appliances are ready. But to winter here has been more than the Swedes would undertake, and for the present the place is deserted; some few Norwegians we have met around the coasts have stopped for a time in the place, hunting, as we were lately doing, for whales, but, like us, they had no success. All the long season they waited for the whale that never came, and as there was nothing else, they left, empty as they came. All the season went by without a chance presenting itself by which a single boat could fill her

hold with Arctic produce, and this account applied to all the few foreign whalers we had met throughout our cruise.

We bore down the coast to Green Harbour, where we found two fishing schooners at anchor; from them we obtained some salmon, said to be peculiar to Spitzbergen. They had been captured by a net which had been the property of the former Russian settlers, and although this net had remained unused for years, it was perfect in its preservation. We found in this fact fresh evidence, if further evidence were needed, of the strange effect this peculiar climate has in keeping everything exposed to it intact. Further up this bay we landed at a place where coal is indicated on the chart, and sure enough we found a rich-looking coal, good enough for most purposes, considering the small portion we gathered, in order that we might have it tested in the galley fire, had been collected from the surface only. Some specimens we brought back gave promise of a much finer quality to be found at some distance below the surface, but we had no opportunity during our short visit of testing it in that particular way. This seam of coal crops out all along the surface for some very considerable distance. We once made inquiries of those on board the steamer off Red Beach if they had used this coal, but it was at once con-

demned by the men as useless, so strong is the prejudice of people wedded to a preconceived opinion. Pushing on into Coal Bay, where we expected to find even a better quality, our surprise was great to see no indication of a seam, or any trace of coal whatever. There was nothing of interest here to detain us after this natural disappointment, and we sailed away further into Green Harbour; and as this place looked a likely one for continuing our geological studies, only so lately roused by the search for carbon, we examined closely along the coast for fossils of every kind. Good eyes once opened upon any special subject are sure to be rewarded, and our search produced a heap of specimens of great geological interest, to us at least. Here we found shells, and wood, and leaves of trees fossilized, and showing the structures of their organization perfectly. Here in former times deciduous trees must have flourished, or why should their stems and leaves abound in a fossil state at the present day? We found semi-fossil bones of the whale and other animals of a later geological period; and we noticed that the water, so pure and delicious to the palate, was too hard to combine with soap in producing a lather in the usual way, and our cocoa paste declined to combine with it under any amount of compulsion.

CHAPTER XI.

"True fortitude is seen in great exploits,
Which justice warrants, and true wisdom guides:
All else is tow'ring frenzy and distraction."

In the last chapter we mentioned a fresh proof of the conservative nature of the Arctic climate, and the most recent fact which goes to illustrate it is the discovery of Barentsz relics at Nova Zembla last year. To understand these facts we give at some length the story of that remarkable man.

According to Burney the historian, permission to discover a way to India by Nova Zembla and along the coasts of Tartary, was readily obtained, in 1580, from the States-General of Holland, who took so great an interest in the enterprise, that they promised a gratuity of twenty-five thousand florins to the individuals who should undertake the voyage, if they succeeded, and also special privileges of trade during the space of eight years, to commence from the date of the discovery.

The first of these expeditions was undertaken by a ship of Zealand, a ship of Enchuysen, one of Amster-

dam, and a fishing-bark; the two first under the command of Cornelis Cornelisz Nay, who had served as pilot with the Muscovites in the Northern seas. In the ship of Enchuysen Jan Huygens van Linschoten went as commis, or agent for the merchants. The ship of Amsterdam and the small bark were under Willem Barentsz, a seaman of great reputation.

On the 5th of June, 1594, the four vessels departed in company from the Texel, and, the 23rd of the same month, arrived at Kilduyn, an island and port near the entrance of the river Kola, in Lapland. From this place W. Barentsz sailed with the Amsterdam ships and the small bark for the North of Nova Zembla. The other vessels directed their course for the Waigatz Strait. In the navigation between Kilduyn and the Northern part of Nova Zembla, 140 fathoms depth of water was found; and at one time of sounding, the depth was more than 150 fathoms, that length of line not reaching to the bottom.

On the 29th of July, Barentsz was in latitude by observation 77° N., the most Northern point of Nova Zembla, then bearing due East. Large impenetrable bodies of ice prevented him from advancing beyond this Cape, and it was therefore named Ys-hoek, or Ice Cape.

The two vessels under Cornelisz Nay, sailed from Kilduyn to the Waigatz. In this passage they had

soundings generally under 60 fathoms; they saw several of the vessels called Loddings, and killed a young whale which measured in length 33 feet.

The lodding is constructed of the interior bark of trees, and instead of nails or iron fastenings, the planks and other parts are sewn or bound together with cords. It has one mast and a square sail.

July the 21st, they saw land before them, which was believed, and which proved, to be Waigatz Island. Linschoten describes it elevated, of good prospect, covered with verdure, but without trees. At three leagues distance they had soundings at 32 fathoms depth; and at a quarter of a league, 10 fathoms. At noon, the latitude was observed 70° 20′ N. "A quantity of floating wood, trunks, branches, and roots of trees, covered the surface of the sea here, and the water was black like the water of the canals in Holland." This muddiness seems to indicate that the wood came from a river not far distant. They sailed S.S.E. along the coast, with depth from 12 to 9 fathoms. There were rocks near the shore, but they showed above water. Snow lay on the land only in a few places.

As they sailed on, they saw wooden crosses, supposed to have been set up by Russians. They sent a boat to the shore, and a man was seen, who ran away very swiftly, although "hobbling from side to side as if

he had been lame, as the Laplanders and Finlanders generally do." The Hollanders pursued but could not overtake him. Two reindeer were seen, which also fled. There was much herbage on the land, flowers of every colour, some of them of fine odour; and lawns, the covering of which was more like moss than grass. Much wood lay heaped on the shores, whole trees large enough to have served for masts and yards if there had been occasion. Some lay far above any high water mark, which was probably effected by ice being forced on the land by the sea, and other ice.

The ships proceeded to the S.E. and South, anchoring at times.

A correct description of the navigation in Waigatz Strait is not to be expected from the early accounts.

Some things are doubtfully expressed, and could not be explained without danger of mistake; but many useful particulars of information may be collected with safety. The imperfection of our present knowledge of this Strait may be imagined, from the charts lately constructed differing something more than two degrees in the latitude of Waigatz Island.

The 22nd they proceeded to the Southward, anchoring at times along the Western coast of Waigatz Island. At noon the latitude was observed 69° 45′ N. In the evening they had a fresh wind at East, and sailed by land which they could not clearly ascertain

whether it was a point of Waigatz Island, or a cluster of small islands near to Waigatz. Here they saw more crosses, and continued their route three leagues further, "till the sun was at North," when they were near an opening about a Dutch league broad, in the middle of which was an island, so that in fact it formed two openings. The Southern appeared larger than the Northern, and from the Southern opening the outer coast lay in a S.S.E. direction. This opening was supposed to be the Strait between Waigatz and the Continent, which accorded with the globes and charts. "We had been told," says Linschoten, "that there was an island to the South of Waigatz, and six other isles farther to the East." The island first mentioned in the opening was distant from them three Dutch leagues, and more distant land seen to the East appeared joined as a single land. As the wind was Easterly, they continued sailing to the S.S.E. At noon on the 23rd, the latitude was observed 69° 13′ N. The weather this day was warm, and they were troubled with gnats. Since the 17th of June they had had the sun constantly above the horizon; but on this night, the 23rd, the sun set at N.N.E. by the compass, and a short time afterwards reappeared at N.E. by N.; whence is to be inferred, that the variation of the compass was two points and a half North-westerly.

The land to the South was ascertained to be part of

the Continent. It was low, and much driftwood lay on the shores. They sailed back Northward to the Strait, and, the wind continuing Easterly, kept working to windward all the 24th. In the morning of the 25th, they sailed between two points of land moderately elevated, and covered with verdure, but without trees. The Southern or continental coast was sandy, and the sea near it rocky. The Northern land (Waigatz Island) was rather higher than the Southern, and level at the top. Crosses were seen in many places, but no appearance of habitations. These coasts were full of sinuosities forming small bays, especially the Northern coast, nearest to which the ships kept.

The wind being contrary, they anchored several times in the Strait. At one time they rode out a gale of wind in the middle of the Strait, a rapid current at the same time running through the Strait from the East, which brought with it large clumps of ice, and kept them in much alarm. This current was affected by the tides ; or more properly was partly tide, for it is afterwards remarked, that with the rising tide the current came from the East, and that the ebbing of the tide was scarcely perceptible. The direction of the Strait was here North-eastward.

In passing through the Strait, the depth under them was at one time not more than four fathoms, but they were then within a stone's cast of the shore. The

26th, latitude was observed 69° 43′ N. On a point of land of the Waigatz they found a number of wooden images rudely carved to resemble men, women, and children, not fewer than three or four hundred, loosely heaped one upon another. Linschoten naturally conjectures that when a Samoyede dies, his friends consecrate an image to his memory. Some of these were worm-eaten and quite decayed; others new and recently carved. Some had several visages on the same trunk, as if to represent many persons of the same family. "No graves, or bones, or other mark of cemetery or repository of the dead, were found here, and perhaps the Samoyedes bring their images here at certain seasons of the year." This cape was named the Cape of Idols. Another cape of Waigatz, more advanced in the Strait, was named Kruyz Hoek, which signifies Cape of the Cross.

On the 29th, an ice island half a league in length drifted through the Strait. It was narrow and came lengthway; "if it had lain athwart it would have entirely closed the passage." One of the ships was at anchor within a projecting point of land, and thither the other went for shelter. The water of the sea here was remarked to be clear, of a deep blue like the water of the ocean, and very salt.

Smokes had been seen rising from different places on the coast, and at small distances within, and men

had been seen at a distance. On the 29th, and afterwards, the Hollanders had friendly communication with some Samoyedes. By means of a Russian sailor belonging to one of the ships, "who had much trouble to understand them," information was obtained that eastward of Nova Zembla was a sea of no great extent, which being passed, there was another extending far. These Samoyedes being questioned, if they were subject to the great Czar of Muscovy, replied that they knew nothing of him. They spoke, however, of Petroza and Pitzano, places which belonged to the Russians, as known to them.

Among a wandering unsettled people like the Samoyedes, it would naturally happen that some might be made to acknowledge themselves subject to the Russians, and others remain long in perfect ignorance of any such claim to their obedience. Descriptions of the Russian empire say that the Samoyedes, or Ostiaks, inhabiting near the river Ob, were compelled to swear fidelity and allegiance to the Russian empire in the following manner:—A mouthful of bread was presented to each man on the point of a knife, and the man, receiving it kneeling, was required to say, or repeat, "If in the course of my life I become unfaithful to my Czar, if at any time I do not pay my

tribute, may a bear devour me, and may this morsel of bread that I am about to eat choke me."

Linschoten says the Samoyedes seen by him were a very diminutive people, "who might be denominated half men. Some among them resembled apes or monsters! Nevertheless," he says, "they are light and alert, jump well, run like stags, with admirable circumspection, casting their eyes from side to side; none of our people could keep pace with them in the race. They have sledges and reindeer, and use bows and arrows, and I think they would make good warriors, if they could be disciplined." He says further, "they are not used to fishing, and live wholly by the chase. We saw no sign of their having boats or water conveyance of any kind, and we observed neither house nor cabin on the shore." Linschoten seems here to have drawn a conclusion from appearances which might more reasonably be otherwise accounted for. It is difficult to imagine that any tribe of Samoyedes, residing occasionally, if not generally, near the sea coast, should not use boats and fish, although nothing of the kind was perceived among those seen by the Hollanders; which very possibly was owing to their having travelled overland from some place where they had fixed their quarters, pur-

posely to visit the Hollanders. It is remarked in Linschoten, that there were no settled inhabitants at Waigatz Island, and that the Samoyedes resorted to it only at times proper for the chase, which in this cold country would scarcely be done (as with the New Hollanders) without boats. At taking leave of the Hollanders, they took off their hats and bowed, so taught doubtlessly by the Russians, and also clapped their hands. The Hollanders, in return, bade them adieu with the sound of trumpets.

From Kruyz Hoek the coast of Waigatz Island lies N.N.E. (by the chart to Linschoten, true), three Dutch leagues to a Cape, which on account of some dispute was named Twist Hoek, and is the outer Eastern Cape on the Waigatz side of the Strait between that Island and the Continent. The opposite outer point was on a small Island a cannon shot distant from the continent, and was named Ton Hoek. The distance between these two points, or breadth of this entrance of the Strait, is little more than a Dutch mile or league (15 to the degree). The ships anchored about a quarter of a league from Ton Hoek, in seven fathoms good holding ground.

From abreast Kruyz Hoek, extending north-eastward to nearly abreast Twist Hoek, lies a bank of sand, or a range of sand-banks and rocks, some level with the

surface of the water and some covered, nearly midway between the continent and Waigatz Island. They found good anchoring ground through the Strait, but subject to disturbance in the fair channel from drifting ice, more or less dangerous according to its size and the velocity of the tide.

On the 1st of August they completed the passage of the Strait by the South of Waigatz Island. "This day," says Linschoten, "we entered the Sea of Tartary."

From the Strait they sailed at first along the coast of the continent, the wind being from the S.W.; and at the distance of a quarter of a league from land had depth from 7 to 10 fathoms. In the evening the wind changed to easterly, and caused them to stand off shore, which in a league and a half sailing brought them into 80 fathoms depth. The sea was also of an azure blue; and these two circumstances were regarded as indications of a large and open sea. The next day, however, they fell in with much ice, but the wind changed again to the S.W., and they were able to follow the continental coast, which Linschoten's chart lays down in a direction E.S.E. true, from the East entrance of the Strait. At the same time it is related, that on the 2nd of August the ships had sailed by the reckoning 17 or 18 leagues along the coast from the

Strait, and that the latitude was observed 70°, which was more North than expected; for the course had been held S.E. and S.E. by E. "We ought to attribute these errors," Linschoten says, "to the variation of the compass." It is however to be remarked, that observations at sea for the latitude, were not at the time to be safely relied on within a third of a degree.

At the distance of something more than twenty leagues from the Waigatz, the coast was found to decline more Southward, forming a gulf, of which they did not see the bottom; but they saw the land on the farther side, where the coast lay in a N.E. and S.W. direction, and they doubted not its being a continuation of the continent. They sailed along this coast to the N.E., not much obstructed by ice, but not favoured by the winds. The sea was deep, their soundings at one time being 132 fathoms, and at another time their lines did not reach the bottom.

On the 11th of August, the farthest land they had in sight to the N.E. was estimated to be fifty Dutch leagues from the Waigatz. "The coast was sandy and clear, and as straight and level as if it had been formed by line and rule." Linschoten relates, "On the distant shore were seen numerous small hills, which had at one time an appearance like trees, at another time like animals. This effect was produced by the

disposition of vapours in the air. At one time we thought we saw three men walking on the strand, but on coming nearer they were found to be hillocks; yet some on board persisted in asserting them to be living beings." Other similar illusions are noticed in this voyage.*

The shore was sandy, but of good elevation, and in parts covered with bulrushes. Soundings were found at a moderate depth near the land. The sea was rough from the northward, "and the coast extended to the north-east, which made us no longer doubt," says Linschoten, "of there being a free passage. The ice had nearly disappeared, and seemed to be already melted; but the north-east and north winds which blew, being contrary to our route, and the season for this navigation being already passed away, it was unanimously resolved to sail back to our own country. Accordingly, in the beginning of the night (of the 11th) we made sail to the W. by N. with the wind at N.N.E. and fair weather; but the sun had not appeared for us to observe our latitude."

With so many favourable circumstances, this was certainly closing the campaign too early. The greatest evil they had met with in this sea was the fogginess of

* In Commodore Byron's voyage, preparation was made for anchoring in a port which the Commodore and his people thought they had discovered; but which proved to be a fog bank.

the atmosphere, which frequently would not permit them to see a ship's length before them, and rendered the navigation perilous. They continued their course W. by N. till noon on the 12th, when the latitude was observed 71° 10′ N.

They repassed the Strait on the 14th, and on the 15th were joined by Barentsz, returning from the North of Nova Zembla. Girard le Ver,* who has written an account of the Northern voyage, and describes this meeting, relates, that "afterwards discoursing together concerning the places they had seen in their voyage, and what each had discovered, he of Enchuysen said, that when he was past the Waigatz he found the sea open, and had sailed good 50 or 60 leagues to the East, so that he was persuaded he was about as far as where the river Ob, which descends from Tartary, falls into the sea, and that the land of Tartary there extends again to the North-east. And he conjectured that he was not far from Cape Tabin, which is the exterior angle of Tartary, whence the coast declines towards the kingdom of Cathay, extending first towards the South-east and then towards the South. That having thus much discovered, as it was late in the year, and their commission ordered them to return before the winter,

* Of the three voyages made by W. Barentsz to the North-east, Girard le Ver sailed with him in the second and third; but wrote a history of all the three.

they sailed back through the Waigatz."* Both outward and homeward, the ships under Nay went through the passage south of Waigatz Island, to which the Hollanders gave the name of Nassau Strait.

It is exceedingly curious, that encouragement should alike have been found for a north-west and for a north-east passage to India, and on authority equally questionable. Whilst a fabulous Strait of Anian was provided for the north-west passage, the mountain Tabin, on the uncertain reports transmitted from the ancient Greeks, was assumed as the northern promontory of Asia, beyond which the land was to decline southward to the Indian Seas. It is so represented in the maps of the best geographers of the latter part of the 16th and of the 17th century.

The 26th of September the four vessels returned to Amsterdam.

It appeared in this expedition, that it was less difficult to pass through the Waigatz than to go by the North of Nova Zembla; that the voyagers had not failed of making the proposed discovery from obstruction by ice or land; and that if they had arrived more early in the sea east of Nova Zembla, there would have been a good probability of their making the passage.

* "Première Partie de la Navigation par le Nord." Amsterdam, 1598, p. 7.

Under this persuasion, in 1595 the Hollanders fitted out seven vessels for the northern navigation, provided both for trade and for prosecuting of the discovery of a passage by the north-east to India. The States General and Prince of Orange took part in the adventure, contributing towards defraying the expense. Jacob Van Heemskerk, J. H. Van Linschoten, and Jan. Cornelisz Rijp, went as commis, or merchants and directors, in the ships to be employed on the discovery, and William Barentsz as captain and principal pilot. It was directed, that as soon as the vessels should have passed Cape Tabin, one of them should be despatched back to Holland with the news of that event.

Notwithstanding that the want of success in the former expedition was attributed principally to the lateness of their outset, the present expedition did not depart from the Texel till the 2nd of July. After passing the North Cape, the ships divided, some going to the White Sea. Those for the discovery proceeded to the Waigatz, and arrived at the entrance of the Strait on August the 19th. The 24th, in the Strait, they met a sem or small lodding, belonging to a port in the White Sea, named Pennago, which had been to the North in search of the teeth of the walrus, whale-oil, skins, and birds, which commodities they sold to Russian merchants. They had been shut up by ice in

Nova Zembla all the summer, in consequence of the late winter having been long and severe; and, according to their information, the Strait north of Waigatz Island, between that and Nova Zembla, was yet full of ice. They said vessels of their country went every year through the Waigatz, and eastward beyond the River Ob, to a place called Ugolita, where they carried clothes and other merchandisé, and were sometimes obliged to winter. That they always endeavoured to pass the winter near forests, and sometimes were necessitated to go many miles inland to find them. They thought it would be yet nine or ten weeks before the passage of the Waigatz would be entirely closed by the ice; but that immediately after the first appearance of the sea freezing, it generally became all at once frozen over, so that people could go on the ice, over the sea, to Tartary.* They said, that beyond the Ob was a large river, named the Gillisse or Jenisei, towards which the Russians went in their loddies to traffic.

On the 30th, the Hollanders were yet in the Waigatz Strait, having been much incommoded by ice. This day one of their boats landed on the south side of the Strait, "the Continent," and met there twenty or twenty-five Samoyedes, who showed themselves

* "Seconde Partie de la Navig. par le Nord," p. 10. And "Rec. des Voy. de la Comp." Vol. i. p. 75.

friendly. The Hollanders gave them victuals, which they received thankfully. At a distance were seen 100 or 150 more Samoyedes. The Hollanders landed again the next day. One among the Samoyedes appeared to be their chief. In answer to inquiries concerning the seas and countries Eastward, they said, "that the sea East of the Waigatz was five days sailing in extent; that then was found another strait, and after passing that strait, was a great sea." They said also, "that beyond the Jenisei was another river named Moleconsay, and just so far extended the domination of the Grand Duke. That the country beyond, to a great extent, was under the dominion of a Tartar Prince."

Whilst the ships were in the Strait of Waigatz, two of the seamen who were on shore, went along the sea-beach to look for shining or curious stones, when a bear approached them softly, and, before he was perceived, seized on one of them, who endeavoured, whilst the bear was beginning to devour him, to defend himself with his knife, but was quickly killed. Above twenty seamen were on shore at the time, and they hastened towards the bear, armed with pikes and arquebuses. The bear, on their approach, quitted his prey, and running towards them, seized another man, whom he tore in pieces. The rest fled at first; but some of them returned and killed the bear.

On the 3rd of September they cleared the Strait, and the sea appeared open and free of ice to the East. They sounded and found the depth more than 110 fathoms. They saw great whales, and the sea was of a fine clear blue; all which were esteemed fortunate indications; but in the evening it blew a storm from the N.W., and a large bank of ice was seen drifting fast towards them. On the 5th they were obliged to take shelter in a bay of the Continent, among rocks, to avoid being pressed on by the ice. They continued in unsuccessful endeavour to advance East North-eastward till the middle of the month, the weather increasing in sharpness and the nights in length. On the 15th, the commanders and principal persons of the fleet held council on board the ship of the Admiral, Cornelis Cornelisz Nay, at which they say: "We, the undersigned, declare that we have done our best before God and before the world, to penetrate by the North to China and Japan, as ordered by our instructions, until we have seen that it does not please God that we should continue our voyage, and that it is necessary we should desist. We therefore have resolved to make our route back to Holland with all diligence."

Signed by the Admiral, and
others of the Council.

After the failure of this second expedition, the States General declined contributing to the further prosecution of the discovery; but they published a declaration, that if any city, company of merchants, or individuals, chose to be at the charge of another voyage, in search of a North-east passage to India, there should be no hindrance; and that if proof should be produced of the discovery of such a passage, they would bestow a pecuniary recompense on the discoverers.

The Council or municipal officers of the city of Amsterdam were not discouraged by the past failures, but fitted out two ships for another attempt. The agreement made with the seamen was, that they should have pay on a certain footing if they returned without succeeding, and on a superior if they were successful. In one ship, Jacob Heemskerk went as merchant or supercargo, and W. Barentsz as chief pilot; in the other, Jan Cornelisz Rijp was merchant and commander.

They set sail on the 18th of May, 1596. The 22nd they had sight of Shetland. Barentsz and Rijp differed here in opinion respecting the course they should pursue. Barentsz proposed to steer for the North end of Nova Zembla. Rijp was for steering a more northerly course, to get far to the North of all the land that was

known, in hopes of finding there a clear sea which would admit of their sailing Eastward. Rijp would not yield, and Barentsz, rather than part company, followed him. On the 9th of June, in 74° 30 latitude, they discovered land, which proved to be an island about five leagues in extent. Here they anchored; and on account of a combat they had with a large white bear, named it Beeren-eilandt.

From Beeren-eilandt they sailed on Northward, and the 19th they discovered another and larger land. Their latitude observed that day was 80° 11′. They sailed along the coast of this land South-westward in search of anchorage, to latitude 79° 30′, and found good harbour, where they anchored in 18 fathoms.

"This land, the most Northern which to this time has been discovered in the world, has nevertheless verdure and herbage. The animals seen here are white bears, some larger than oxen; reindeer, who feed on moss, and become so fat, that their flesh is excellent eating; here are also foxes, white, grey, and some black. It was the difference between Willem Barentsz and Cornelisz Rijp that gave rise to the discovery of this land. It is named by the Hollanders Spilberg or Spitzbergen,* which signifies spindle or sharp-pointed mountains."

* "Rec. des Voyages de la Comp." Vol. i. p. 93, *et seq.*

The 21st they killed a white bear, whose skin, the journal says, measured thirteen feet. He had swum to the ships, and being intercepted in endeavouring to retreat to the shore, was pursued a league out to sea, and made great resistance before he was overcome. At one time he laid his paw upon the boat, fortunately for those in her, on the fore part; if it had been in the middle he would most probably have overturned her.

On the 23rd they weighed anchor, and would have proceeded Northward, but fell in with ice, which obstructed their progress; and on the 1st of July they were again in sight of Beeren Island. Here they finally differed about the course. Rijp would return to the North, and Barentsz would sail immediately East, and neither prevailing with the other, they separated by agreement. They were each eminently anxious for the discovery; and it may be said, that by separating, they gave a better chance for making it than by remaining together, and at the expense of increasing their own peril.

On the 17th of July, Barentsz made the land of Nova Zembla; but on the 16th of August, his vessel was no farther advanced than to the North-eastern extremity. The coast from hence

took a direction first to the S.S.E. and afterwards to the South, and the sea appeared open to the South-east, which made many on board flatter themselves that the success of their voyage was certain; but this delusive appearance was of short continuance. In the course of the next ten days they were so much incommoded and entangled with floating ice, that they thought it necessary to look to their retreat. In the evening of the 26th they were forced into a bay of the North-eastern, or of the most eastern part of Nova Zembla, for they had passed round the North end of the Island; and the next day the ice closed upon them with so much violence, that the vessel was lifted or forced upon it as if aground from one end to the other. In this danger they set to work to make the best preparation they could with their boats, in case of being obliged to quit the ship. On the 28th the ice separated a little, and the ship nearly recovered her proper position, when the ice again closed upon her, and the frame of the ship, and the ice all around cracked in so frightful a manner as to fill them with apprehension that she would break in pieces. "The ice was in greater heaps, and more pressed under the vessel on the side whence the current came than on the other, and she had at first leaned much; but at

length, by a continuance of fresh pressure of the ice, she was set upright, and mounted on a bank of ice, as if purposely done with screws and other machines." On the 31st the ice came in greater quantities, large bodies being forced by currents one over the other. The stem of the vessel was lifted five feet higher than the stern, and the rudder was broken. On the 5th of September, "after supper," the pressure of more ice threw the vessel entirely on one side, and she opened in different places. No prospect remained but of wintering on the spot, and they immediately turned their attention to building a house or hut, which should protect them from the cold, and from wild beasts, or rather from the bears, which were the only animals from whom they expected attack. On the sea-shore, but at a considerable distance from where the ship lay, was found a quantity of wood, some of it whole trees with their roots, which it was supposed had floated there from the continent, as no appearance of wood growing had been seen in the northern part of Nova Zembla. They constructed sleds for removing the timber, and on the 16th made a beginning, by transporting four large logs above a league over the ice or snow, to the place chosen near the vessel for erecting their hut. On the 23rd

the carpenter died. Their number remaining was sixteen.

The ground was frozen so hard that they could not make a ditch, but they nevertheless began to erect their building, the sides of which they constructed of timbers squared so as to lay smooth and close one upon another; and they made large fires to soften the earth, by which means they enclosed their building round about with it like a rampart, which must have been a great defence against the severity of the weather. Whilst thus employed, on the 26th of September, the wind came from the west, which drove the loose ice that was afloat out from the land, and left the sea open near the coast; but if the ship had been in good condition, no advantage could have been taken of this, for the ice on which she rested was a close-packed body, of depth that reached to the bottom and took the ground, so that she lay as upon a fixed and solid rock. They therefore diligently continued their work, with the frost at times so severe, that if a man inadvertently put a nail in his mouth, as is frequently done by workmen, it took off the skin, and the blood would follow; and one man lost a great toe by the frost; but by the 2nd of October the hut was completed. The latitude was at different times observed to be 76° North.

They were annoyed at first by the visits of bears; but these animals, after short experience, became so cautious, that they would be frightened away by shoutings or by the sound of trumpets. When they came to attack, if at any time, for want of other ammunition, a clump of wood or other thing was thrown at them, they would, like dogs, run to seize on what was so thrown.

On the 4th of November they wholly lost sight of the sun, and in this month the bears disappeared. In their stead, foxes came, some of which were caught in traps.

The winter passed with less of suffering than could have been expected. Once they were in danger of being suffocated by sleeping with a charcoal fire in their hut. Towards the end of January the foxes disappeared, which was conjectured to be an indication that the bears would shortly return, and so it happened.

On the 24th of January, as Jacob Heemskirk, Girard le Ver, and another person, were walking from their hut to the sea-side, the weather being clear, they were surprised with a sight of the northern limb or edge of the sun. This, the journal says, was fifteen days earlier than, according to calculation, any part of the sun could have been visible to them; and

Barentsz would not be persuaded that they had not been deceived, which caused wagers to be laid. The 25th and 26th there was too thick a fog to determine the dispute; but the 27th was a clear day, and the entire orb of the sun was seen above the horizon, whence there could remain no doubt that a part had been visible on the 24th. The journalist has been at pains to shew, that they had not erred in their reckoning of time, as might be conjectured from their having been so long without seeing the sun. Nothing is said of refraction, and probably it was not thought of, or was ill understood, and seldom allowed for in maritime observations at that early period.

From the 4th of November, when they wholly lost sight of the sun, to its reappearance, January the 24th, was eighty-one days. The middle time may be supposed the winter solstice, and the declination of the sun corresponding to forty and a half days from the time of the solstice, is 17° 24′ S. The latitude being 66° N. will give 93° 24′ for the distance of the sun (its centre) from the zenith, when its northern limb was first seen. Allowing 16′ for the sun's semi-diameter will leave about three degrees for the refraction and depression of the horizon, the latter of which was probably under a quarter of a degree. The effect

of the refraction then must have been not much less than three degrees.

In some other northern voyage it has been remarked, that the sun was seen twenty minutes sooner, and as much later, than the regular time of sun-rising and setting. Mr. Bayly, who sailed as astronomer in the last voyage of Captain Cook, related to me, that when he was assistant astronomer to Maskelyne, cattle which fed in a meadow on the opposite side of the Thames were visible from Flamstead House at high water, and hid by the bank at low water. The effect of refraction in giving apparent altitude to distant objects which are in reality below the horizontal level, appears in all these cases to have been many degrees.

As the water rose in the river, the objects on the farther side would be seen through a more dense medium, and the effect produced seems to have been giving apparently to the whole plain or surface beyond the river, an inclination or increase of inclination towards the beholder; the distant parts being the most refracted, as must be the case in the plain of a glacis so rendered visible, which is to be ascribed to the more distant object being seen through a longer extent of atmosphere. From similar causes it may be imagined that the apparent horizon at sea will

sometimes be a water-line more distant, and of course more elevated, than a true horizontal line.

Whether the real cattle were seen, or the increased density of the medium rendered it capable of receiving as in a mirror, and reflecting, the image of the cattle, is a very disputable question. The mind is not well satisfied with the hypothesis of inflected or bent rays and circuitous vision; a difficulty likewise not easy to surmount, is to explain how a thing may be seen where it is not. The image of an object which is not within an unobstructed right line of vision is frequently received by a long train of reflections, every stage of which is distinguishable, or clearly traceable, from the substance to the eye of the beholder. Appearances of distant objects in the horizon are seen through a great length of the most dense part of the atmosphere, which may be capable of communicating the image of an object by the transmission of a series of refractions, all rectilinear, although otherwise susceptible of great varieties, as sometimes an inversion of the original objects, exhibiting them floating in the air, with other phenomena not less strange; which transmissions being imperceptible, may aggregately give the appearance of flexible rays.

Whether the apparent horizon at sea is a refracted line more elevated than the true horizon, is a question

worth determining, as if that is the case, all altitudes taken at sea must require a like correction on that account, independent of the correction which may be necessary for the refraction in altitude of the object observed. It seems probable also, that the refraction of the horizon may be liable to variation with the state of the atmosphere.

When the height of the observer above the level of the sea is known, the depression of the real terrestrial horizon is correctly ascertained on trigonometrical principles; accordingly, by observing the vertical arc contained between two opposite points of the apparent horizon, the refraction of the horizon can be determined, the difference of the observed vertical arc from the half circle being the combined effect of dip and refraction.

So much snow fell during the winter, that the Hollanders had almost every day to clear the entrance of their hut.

On the 13th of February, a great bear came close to their hut, which they shot, and obtained from the carcass above a hundredweight of fat or lard. On the 8th of March, the sea to the North was observed to be quite clear of ice, which made them conjecture there was a great extent of open sea in that direction. The next day the sea appeared equally open and clear to the North and North-East; but more eastward, and

to the S.E. there was ice; and to the South and S.E. they saw an appearance like land, but could not ascertain whether it was land or clouds.

In the night of April the 6th, during a thick fog, a bear came to the hut and endeavoured to force in the door. The Hollanders tried to shoot him, but, from the dampness of the weather, it was with much difficulty they could get one of their arquebuses to go off, which made the bear retire; but he returned in about two hours after, and mounting the roof of the hut, shook the chimney with all his might, endeavouring to pull it down, making at the same time a terrible roaring or noise. After much ineffectual trial, he went quietly away.

Towards the end of May, they began to prepare their two boats, both open, with washboard, sails, &c., for their departure, as the only means for their escape from this desolate country. It was proposed to repass round the north end of Nova Zembla, in preference to seeking a passage southward on the East side, and that way through the Waigatz Strait. On the morning of June the 14th, they embarked in the two boats, with the remains of their provisions and some small packets of their best merchandise, and quitted the place where they had passed a winter of more than eight months' continuance.

Barentsz had been some time ill. One of the sea-

men, Nicolas Andrisz, was likewise ill. That they might be the more commodiously attended, they were embarked one in each boat; but all the care and nursing that could be bestowed on them, exposed to the open air in a small boat, was not capable of saving them from falling victims to the severity of the weather. On the 16th, the boats were at the Isle Van Orange, which lies near the northern extremity of Nova Zembla. The next day they were beset by ice, and remained the three following days without being able to proceed. On the forenoon of the 20th, word was brought to Barentsz that Andrisz appeared to be drawing to his end. Barentsz said, in reply, that he believed his own was not far distant. The people in the boat with him, seeing that he was at this very time inspecting and considering a chart which Girard le Ver had made of the places they had seen in the voyage, did not apprehend immediate danger, but continued sitting and conversing, till Barentsz put down the chart and asked for some drink, to which he was helped, and immediately after expired, to the great affliction of his remaining companions, he being esteemed one of the most capable seamen of his time.

They proceeded westward and southward along the western coast of Nova Zembla, as well as the ice and

weather would permit them. On the 28th of July they had the good fortune to meet two Russian loddies, and to obtain from them a supply of provisions. They also learnt that three Dutch ships were lying at Kola; and after a fatiguing navigation, having been obstructed by ice from entering the White Sea, on the 25th of August they arrived at Kilduyn. Here, not less to their surprise than satisfaction, in a short time came to them with provisions and refreshments, Jan Cornelisz Rijp, who commanded one of the Dutch ships then lying at Kola, and who the year before had sailed from Holland in company with Jacob Heemskerk and W. Barentsz, from whom (as related) he had separated to seek by a more northerly route, a passage to India. He had not succeeded in that attempt, and had returned to Holland; and was now again homeward bound from a trading voyage to the White Sea.

Jacob Heemskerk and his remaining companions embarked with Rijp, and they arrived at Amsterdam on the 1st of November, 1597.

Of the seventeen men cast on Nova Zembla, the carpenter and another man died there; Willem Barentsz and two other men died whilst navigating in the small boats along the coast of Nova Zembla; and twelve lived to return to their native country. What

doubtless much contributed to their preservation, was their sea provision being well cured, which is particularly noticed by the journalist, who remarks that it was as good at the time of its being used as when first put up.

The house also in which they had passed that memorable winter remains to the present day, and its contents were found in a condition but little altered, when some Dutch sailors entered, in the season of 1872, the long closed door. There they found such of the various articles saved from the wreck in 1596 as were too cumbrous to carry away in the boat the survivors had constructed, and by whose means they had made their escape. The shoes of the little ship's boy who died in the winter lay there, along with his flute, along with the rapiers and halberts, gun-barrels, and earthenware utensils, as well as white metal vases and quaint metal articles, destined, perhaps, for gifts to Oriental potentates, when the Orient was gained. They found also the most recent printed books of that period on China and India, with nautical works, and a curious metal disk, made by Plaucius, the great instrument maker of that day; it was found to be based on a wrong principle, however, and though described in old books of scientific purport, never again repeated, although this one is

specially mentioned. These, with a clock and other precious relics, are now deposited in the Royal Museum at the Hague, and we are able to give, on page 11, a slight sketch of the group as it is arranged in the Museum.

CHAPTER XII.

"I go across the ocean foam,
Swift skating to my southern home,
Upon the ocean skates fast driven,
By gales, by Thurse's witch wife driven."
Saga of King Harald Greyskin.—LAING.

ON the eleventh we weighed and paid a visit to the salmon lake from whence the fish we had received the other day had been taken. This lake lay at the foot of the mountains, and was about two miles in extent. The scenery here was peculiarly striking, and to the lover of the rod and line a more enchanting scene could hardly be found elsewhere. The day was lovely, the air bright and serene; we hurried along the distance that separated us from our expected sport with feelings not to be described, and were looking forward to the successful capture of splendid char or Alpine trout without fear of hitch of any kind, but when we arrived, the water, to our dismay, was frozen over, and we could not use our net for fishing. Winter surely comes, and it is time for us to return home—time to hasten too, for up here in the north when winter approaches, it comes with such haste as we have little experience

of at home, and an Arctic winter must not be trifled with if we mean to go. The rest have already gone. The Norwegians have many superstitious beliefs to compel them to hasten home, and besides they have scant provision for the voyage, only intended to last them till October. They go back, poor fellows, empty this season to begin again later in the year along their own coast with the herring fishery, when we hope they may have such luck as will repay them for their ill-spent time in these desolate waters of the Spitzbergen Islands. Now our acquaintance with wild nature grows more limited every day. The wild geese begin to wing their way to the far south; most of the migratory birds have gone, and we turn to look again upon a land, uninhabited no doubt, but a land full of pleasant recollections: the climate, with all its threatening aspect, so well suited to the manly sports we entered on by land and sea; the whole region, rough beyond compare, but still a region of enchantment and delight. It is a world in itself, of which the traveller who has not seen it can form no conception whatever—where the light of heaven is so unlike what we elsewhere experience, that we are unable to describe it. Its ice blinks and auroras, its heavy blue reflections against which the prismatic ice glitters in the purest light of day; and all the

family of nature that dwells here in its vast expanse of water—its whales and walrus, amphibious bears and seals, the host of winged sea-fowl, and stately deer.

We found Professor Nordenskiold a very pleasant man advanced in life, and his selected party full of zeal in the honourable undertaking they had entered upon: they seemed inspired with the enthusiasm of their leader, who certainly manifested all the *aplomb* of a man confident of success. They were waiting here for a supply of coal to be brought to them by a steamer not yet arrived. Every day at this season is precious time lost; the sun has already set in the heavens, and the long night of the Arctic seas gradually approaches. They are a long way from the point they have selected for their winter quarters, and the road is being rendered more difficult as the season advances. Their intention is to sail along the western coast we have lately visited, and then to fight their way to the Seven Islands along the unusually frozen sea which bounds the coast to the north. Arrived at their halting place they have much work to do before they can hope to be settled fairly down in their winter quarters. They bring with them all the requisite materials for the construction of a home, and to expedite this laborious undertaking they have had the wooden houses

carefully constructed, and after every detail had been duly inspected the little buildings were taken down with care, in order that their readjustment would present no insurmountable difficulty to the crews engaged upon their reconstruction on the selected site at the Seven Islands. We noticed the materials for three of these huts—a dwelling consisting of four sleeping-rooms, fourteen feet by thirteen; a long room for the men, twenty-two by fourteen; a central room nineteen by twenty-two; and a kitchen twenty-two by sixteen. With Professor Nordenskiold came a Lieutenant Palander, of the Italian Navy, who is deputed by his Government to observe the necessary arrangements, with the ultimate object of collecting materials for the guidance of an Italian expedition to the North Pole; so that we shall have an accession to the number of foreign explorations if this gentleman reports favourably of what he experiences to his Government.

There are besides Lieutenant Wykander and Lieutenant L. Palander, the captain of the steamer, Dr. Euran, an experienced physician and good observer, one mate, two engineers, eleven seamen, and four Laplanders, twenty-three in all. Of these Professor Nordenskiold has selected Lieutenant Palander, four seamen, and the four Laplanders, to accompany him

on his voyage over the ice. The boats, constructed of the lightest materials, will be drawn by a herd of forty reindeer.

The boats deserved much attention. They were three in number, built specially for the occasion they were to serve. They were light and exceedingly strong, double in structure: one portion was made of the fine wood of the willow, the second layer of ash. The largest weighed 320 lbs., and could carry 2800 lbs. of goods stowed; the second weighed 100 lbs. less, and carried 1000 lbs. less goods; while the third was only 130 lbs. in weight, and could contain about 1500 lbs. weight in stowage. The deer were to bring with them sufficient provender for an extended march, and on showing signs of exhaustion, they were to be killed for food for the travellers. The journey was to be commenced on the first of April, 1873, and the provisions were sufficient to last until the first of July, by which time they hope to have accomplished this long meditated journey to the northern Pole of the earth.

It will be remembered that Captain Parry, in the year 1827, started late in the season, when he found the ice broken up and loose, drifting by the influence of the currents and the gales of wind. They hope to find a different condition altogether. When they start they expect that at that early season the ice will be

newly formed, or at all events sufficiently permanent and with no greater difficulties of surface to contend with than occasional hummocks of drifted snow, with perhaps some *pseudo* icebergs. Dr. Hayes, the American traveller, with his fellow countryman Kane, have deserved well of the enterprising Americans under whose auspices they made such valuable explorations, already recorded in the volumes of Arctic voyages which bear their respective names, and from which it will be seen, that when in Baffin's Bay they found the ice broken in the winter, no doubt assisted by the strong current which there obtains—a current, be it noted, which runs seven knots in the hour. Such a current, if it exists at all to the north of the Spitzbergen Islands, was not noticed by us. Should the ice again, under the influence of some gale, get broken up, it is reasonable to suppose that the injury will soon repair itself in a temperature so low. Off Jan Majen's Island the ice freezes together in the early spring, as the sealers, who go there at that early season of the year, are often beset in the ice, and the whole field is frozen together in a very short space of time, cutting off any chance of escape until the solid mass floating down towards the northern shores of Iceland is sighted some six weeks later.

The following extracts from Parry's journal (a scarce

work) prove that we are justified in holding to our opinion that this is the true gateway to the Pole :—

"Our plan of travelling being nearly the same throughout this excursion, after we first entered upon the ice, I may at once give some account of our usual mode of proceeding. It was my intention to travel wholly at night, and to rest by day, there being, of course, constant daylight in these regions during the summer season.

* * * * *

"The only disadvantage of this plan was, that the fogs were somewhat more frequent and more thick by night than by day, though even in this respect there was less difference than might have been supposed, the temperature during the twenty-four hours undergoing but little variation. This travelling by night and sleeping by day so completely inverted the natural order of things, that it was difficult to persuade ourselves of the reality. Even the officers and myself, who were all furnished with pocket chronometers, could not always bear in mind at what part of the twenty-four hours we had arrived; and there were several of the men who declared, and I believe truly, that they never knew night from day during the whole excursion."*

* Had we succeeded in reaching the higher latitudes, where the change of the sun's altitude during the twenty-four hours is still less

Steering due north, he states we made good progress, our latitude by the sun's meridian altitude at midnight being 80° 51′ 13″. Soon after they observed that a considerable current was setting us to the eastward just after leaving the land, so that we had made a N.N.E. course, distance about ten miles.

* * * * *

"We here perceived that the ice was close to the northward, but to the westward discovered some open water, which we reached after two or three hours' paddling, and found it a wide expanse, in which we sailed to the northward without obstruction, a fresh breeze having sprung up from the S.W. The weather soon after became very thick, with continued snow, requiring great care in looking out for the ice, which made its appearance after two hours' run, and gradually become closer, till at length we were stopped by it at noon, and obliged to haul the boats upon a small floe-piece, our latitude by observation being 81° 12′ 51″."

* * * * *

perceptible, it would have been essentially necessary to possess the certain means of knowing this; since an error of twelve hours of time would have carried us, when we intended to return, on a meridian opposite to, or 180° from, the right one. To obviate the possibility of this, we had some chronometers constructed by Messrs. Parkinson and Frodsham, of which the hour-hand made only one revolution in the day, the twenty-four hours being marked round the dial-plate.

Once fairly started, the intrepid voyager states :—

"We set off on our first journey over the ice at ten P.M. on the 24th, Table Island bearing S.S.W., and a fresh breeze blowing from W.S.W., with a thick fog, which afterwards changed to rain. The bags of pemmican were placed upon the sledges, and the bread in the boats, with the intention of securing the latter from wet; but this plan we were very soon obliged to relinquish. We now commenced upon very slow and laborious travelling, the pieces of ice being of small extent and very rugged, obliging us to make three journeys, and sometimes four, with the boats and baggage, and to launch several times across narrow pools of water. This, however, was nothing more than we had expected to encounter at the margin of the ice, and for some distance within it; and every individual exerted himself to the utmost, with the hope of the sooner reaching the main or field ice.

* * * * *

"We pursued our journey at half-past nine P.M., with the wind N.E., and thick weather, the ice being so much in motion as to make it very dangerous to cross with loaded boats, the masses being all very small. Indeed, when we came to the margin of the floe-piece on which we had slept, we saw no road

by which we could safely proceed, and therefore preferred remaining where we were, to the risk of driving back to the southward on one of the smaller masses.

* * * * *

"Again, after hauling the boats to the edge of the floe we found such a quantity of loose rugged ice to the northward of us, that there was no possibility, for the present, of getting across or through it. Soon afterwards the whole of it became in motion, and driving down upon the floe, obliged us to retreat from the margin, and wait for some favourable change. We here tried for soundings, but found no bottom with two hundred fathoms of line. The weather was beautifully clear, and the wind moderate from the S.W. From this situation we saw the easternmost of the Seven Islands, bearing S.b.W.; but Little Table Island, though more to the northward, yet being less high, was not in sight. Observing a small opening at 10.30 P.M., we launched the boats, and hauled them across several pieces of ice, some of them being very light and much decayed. Our latitude, by the sun's meridian altitude at midnight was 81° 23′; so that we had made only eight miles of northing since our last observation at noon on the 25th.

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"We had passed, during this day's journey (July the 30th), a great deal of light ice, but, for the first time, one heavy floe, from two to three miles in length, under the lee of which we found the most open water. A number of rotges and ivory-gulls were seen about the 'holes' of water, and now and then a very small seal. We set out again at 11·30 A.M., the wind still fresh from the S.W., and some snow falling; but it was more than an hour before we could get away from the small piece of ice on which we slept, the masses beyond being so broken up, and so much in motion, that we could not at first venture to launch the boats. Our latitude, observed at noon, was 81° 30′ 41″. After crossing several pieces, we at length got into a good 'lead' of water, four or five miles in length; two or three of which, as on the preceding day, occurred under the lee of a floe, being the second we had yet seen that deserved that name. We then passed over four or five small floes, and across the pools of water that lay betwixt them. The ice was now less broken up, and sometimes tolerably level; but from six to eighteen inches of soft snow lay upon it in every part, making the travelling very fatiguing, and obliging us to make at least two, and some-

times three, journeys with our loads. We now found it absolutely necessary to lighten the boats as much as possible, by putting the bread-bags on the sledges, on account of the 'runners' of the boats sinking so much deeper into the snow; but our bread ran a great risk of being wetted by this plan.

* * * * *

"We had seen, in the course of our last journey, a few rotges, a loom, an ivory-gull, a mallemucke, and a tern (*Sterna arctica*).

"We here observed the dip of the magnetic needle to be 82° 4′·7, and the variation to be 13° 16′ westerly; the latitude being 81° 45′ 15″, and the longitude, by chronometers, 24° 23′ East, by which we found that we had been drifted considerably to the eastward. In this situation we tried for soundings with four hundred fathoms of line, without reaching the bottom; the temperature at that depth, by Six's thermometer, was 30°, that at the surface, at the time, being 32½°, and of the air 34°.

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"The rain of the 11th, which was very unusually heavy, ceased soon after we had halted, but was succeeded by a thick, wet fog, which obliged us, when we continued our journey, to put on our travelling

clothes in the same dripping state as when we took them off. The wind continued fresh from the south-eastward, and at nine P.M. the weather suddenly cleared up, and gave us once more the inconceivably cheering, I had almost said the blessed sight of a blue sky, with hard well-defined white clouds floating across it. There was not, however, much dryness in the atmosphere, the dew point, by Daniell's hygrometer, being 35° at nine P.M., when the temperature of the atmosphere was the same. We considered ourselves fortunate in having any floes to cross, though only one or two exceeded a quarter of a mile in length, and all very rugged and much covered with ponds of water; but this was better than the more frequent and hazardous launching among small pieces.

"Again halting at midnight to dine, we obtained the sun's altitude, which placed us in latitude 82° 11′ 51″. On continuing our journey, after dinner, we still had small floe-pieces to pass over, several of which gave us much labour, and occupied considerable time, being just too widely separated to make bridges of the boats, so that launching them was unavoidable. We halted at six A.M., after making, by our day's exertions, only three miles and a half of northing, and then obtained the dip of the magnetic needle, 82° 16′·3, and the variation 15° 6′ westerly, our latitude

at this time being 82° 14′ 28″, and our longitude by chronometers 22° 4′ E.

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"On the 15th, in proceeding over the floe, on which we had slept, we found it alternately level and 'hummocky,' the former affording sufficiently good travelling to allow us to carry all our baggage at one journey with great ease, one boat's crew occasionally assisting the other for a few yards together; but the hummocks cost us immense labour, nothing but a "bowline haul" being sufficient, with all our hands, to get the boats across or between them. At eight the rain again became heavier, and we got under shelter of our awnings for a quarter of an hour, to keep our shirts and other flannel clothes dry; these being the only things we now had on which were not thoroughly wet. At nine we did the same, but before ten were obliged to halt altogether, the rain coming down in torrents, and the men being much exhausted by continued wet and cold, though the thermometer was at 36°, which was somewhat above our usual temperature.

"The wind shifted to the W.S.W. in the afternoon, and the rain was succeeded by a thick fog, after it had been falling for thirty hours out of the last thirty-one. At half-past seven P.M. we again pursued our journey,

and after much laborious travelling, were fortunate, considering the fog, in hitting upon a floe which proved the longest we had yet crossed, being three miles from south to north, though alternately rugged and flat. From this we launched into a lane of water half a mile long from east to west, but which only gave us a hundred and fifty yards of northing. We had then several other small pools to cross, and on one occasion were obliged to cut a place for hauling up the boats, the margin consisting of a tier of high and continuous hummocks. In hauling one of the boats over a 'tongue' of ice, where she only floated in part, her bottom-boards were raised by the pressure against the ice below, but so strong and elastic was their construction that she did not suffer the slightest external injury. We frequently, during fogs, saw a broad white fog-bow opposite the sun; but one which appeared to-night was strongly tinged with the prismatic colours.

"The floe on which we stopped to dine at one A.M., on the 16th, was not more than four feet thick, and its extent half a mile square; and on this we had the rare advantage of carrying all our loads at one journey. At half-past six the fog cleared away, and gave us beautiful weather for drying our clothes, and once more the cheerful sight of the blue sky. We

halted at half-past seven, after being twelve hours on the road, having made a N.b.W. course, distance only six miles and a quarter, though we had traversed nine miles. The thermometer was unusually high in the shade, having risen to $37\frac{3}{4}°$; in the sun it stood at 47°; a blackened bulb raised it to $51\frac{1}{2}°$; and the same thermometer, held against the black painted side of the boat, rose to $59\frac{1}{2}°$. This was during a calm: but almost the smallest breath of wind immediately reduced them all below 40°. We saw, during the last journey, a mallemucke and a second Ross' gull; and a couple of small flies (to us an event of ridiculous importance) were found upon the ice. We here observed the variation of the magnetic needle to be 17° 28′ westerly, being in latitude, by observation, 82° 26′ 44″ (or two miles to the southward of our reckoning), and in longitude, by chronometers, 20° 32′ 13″ East.

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"We were to-day almost unusually fortunate in meeting with some open water, one lane of which gave us, though by a very crooked course, a mile and a half of northing, besides other smaller ones. The sea-water, in one of the largest of these lanes, was at the temperature of 34°, being almost the only instance I remember of such an occurrence in a sea thus loaded

with ice, and at so short a distance from it. We now no longer saw any birds in the 'holes' of water, as we had done farther south. From a hummock forty feet above the level of the sea, and with a very clear and transparent atmosphere, nothing but ice, with a few small patches of water, could be discerned in any direction. The floes were larger to-day, and the ice, upon the whole, of heavier dimensions than any we had yet met with. The general thickness of the floes, however, did not exceed nine or ten feet, which is not more than the usual thickness of those in Baffin's Bay and Hudson's Strait; while it is a great deal less than the ordinary dimensions of the ice about Melville Peninsula, and not half the thickness of that towards the western extremity of Melville Island, though these places lie from eight to twenty degrees south of our present latitude.

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"Our way still lay over small loose masses, to which we were now so accustomed as scarcely to expect any other; for it was evident enough we were not improving in this respect as we advanced northwards. At half-past nine we came to a very difficult crossing among the loose ice, which, however, we were encouraged to attempt by seeing a floe of some magnitude beyond it. We had to convey the sledges and

provisions one way, and to haul the boats over by another. One of the masses over which the boats came, began to roll about while one of them was upon it, giving us reason to apprehend its upsetting, which must have been attended with some very serious consequence; fortunately, however, it retained its equilibrium long enough to allow us to get the boat past it in safety, though not without several of the men falling overboard in consequence of the long jumps we had to make, and the edges breaking with their weight. Towards midnight we had some smart showers of rain, with dry clear intervals between them, just as on an April day in England. This kind of weather, which continued for several hours, harassed the men very much, as it was too warm for working with their jackets on, and they wetted their shirt-sleeves when they took them off. I think the blue sky between the clouds this night was as transparent, and almost of as deep a blue as I ever saw it. We had nearly incurred a second disaster in launching one of the boats from an awkward-shaped mass, which brought her gunwale close to the water, and there kept for a quarter of an hour in a very dangerous situation, without our being able to move her one way or the other, while the loose ice was in motion about us at the time. At length, however, we contrived to

reach the floe, after consuming the best part of the day's journey in effecting it; and when we halted to rest at half-past seven A.M., twelve hours' labour had not been repaid by more than three miles and a half gained, on a N.N.E. course.

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"On the morning of the 20th we came to a good deal of ice, which formed a striking contrast with the other, being composed of flat bay-floes, not three feet thick, which would have afforded us good travelling, had they not recently been broken into small pieces, obliging us to launch frequently from one to another. These floes had been the product of the last winter only, having probably been formed in some of the interstices left between the larger bodies; and, from what we saw of them, there could be little doubt of their being all dissolved before the next autumnal frost. We halted at seven A.M., having, by our reckoning, accomplished six miles and a half in a N.N.W. direction, the distance traversed being ten miles and a half. It may, therefore, be imagined how great was our mortification in finding that our latitude, by observation at noon, was only 82° 36′ 52″, being less than *five* miles to the northward of our place at noon on the 17th, since which time we had certainly travelled *twelve* in that direction.

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"The largest floe was from two and a half to three miles square, and in some places the thickness of the ice was from fifteen to twenty feet. Still these were 'fields;' for in no one instance had we any difficulty in seeing the margins of them in more directions than one, by mounting a tolerably high hummock; and from a much less elevation than that of a ship's masthead, the whole extent and form of such floes would have been very easily discernible. However, it was a satisfaction to observe that the ice had certainly improved; and we now ventured to hope that, for the short time that we could still pursue our onward journey, our progress would be more commensurate with our exertions than it had hitherto proved. In proportion, then, to the hopes we had begun to entertain, was our disappointment, in finding, at noon, that we were in latitude 82° 43′ 5″, or not quite four miles to the northward of yesterday's observation, instead of the ten or eleven which we had travelled! However, we determined to continue to the last our utmost exertions, though we could never once encourage the men by assuring them of our making good progress, and setting out at seven in the evening, soon found that our hope of having permanently reached better ice was not to be realised;

for the floe on which we slept was so full of hummocks, that it occupied us just six hours to cross it, the distance in a straight line not exceeding two miles and a half. At midnight, on the 22nd, we had a good observation in latitude 82° 43′ 32″, being, as usual, the mean of two observers. After this, our road once more consisted of small rugged masses, and little pools of water, requiring many launches. In addition to these impediments, the wind, which had been from the N.N.W. at our setting out, again shifted to north, and freshened up considerably. We halted at seven A.M., after a laborious day's work, and I must confess, a disheartening one to those who knew to how little effect we were struggling; which, however, the men did not, though they often laughingly remarked that "we were a long time getting to this 83°!" Being anxious to make up, in some measure, for the drift which the present northerly wind was in all probability occasioning, we rose earlier than usual, and set off at half-past four in the evening.

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"When we first launched the boats, our prospect of making progress seemed no better than usual, but we found one small hole of water leading into another in so extraordinary a manner that, though the space in which we were rowing seemed to be always coming

to an end, we continued to creep through narrow passages, and when we halted to dine at half an hour before midnight, had only hauled the boats up once, and had made, though by a winding channel, four or five miles of southing. This was so unusual a circumstance, that we could not help entertaining some hope of our being at no great distance from the open sea, which seemed the more probable from our having seen seven or eight narwhals, and not less than two hundred rotges, a flock of these little birds occurring in every hole of water. The wind was from the southward, with a thick fog, and the clear water increased so much, as we proceeded, that at six A.M., on the 9th, instead of hauling up the boats as usual we served an extra supper, and then pursued our way.

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"The distance traversed during this excursion was five hundred and sixty-nine geographical miles; but allowing for the number of times we had to return for our baggage during the greater part of the journeys over the ice, we estimated our actual travelling at nine hundred and seventy-eight geographical, or eleven hundred and twenty-seven statute miles. Considering our constant exposure to wet, cold, and fatigue, our stockings having generally been drenched in snow-

water for twelve hours out of every four-and twenty, I had great reason to be thankful for the excellent health in which, upon the whole, we reached the ship.

"There is no doubt that we had all become, in a certain degree, gradually weaker for some time past; but only three men of our party now required medical care, two of them, with badly swelled legs and general debility, and the other from a bruise; but even these three returned to their duty in a short time."

This enforced return of Parry is so interesting in its minutest details we have no scruple in our conscience in drawing so largely from it. It is only after a careful perusal of its stirring events that we can comprehend the regret this great man must have felt when at last compelled to return southwards, more especially since he had looked wistfully towards the northern sea, and could hardly detect upon its surface a floe large enough to float his party and boats upon, and the water to the southward of his position was so open, their progress home was through long lanes of water bounding thin fields of ice, so thin that they were incapable of offering support to the boats, and over water thinly covered with newly-formed films of ice a steamer would have found no difficulty, worthy of the name, in forcing a way through. And if it

should happen that a steamer did get caught in the ice here, she would naturally drift south, at the rate of about six miles each day, that being the rate at which the ice fields move during the year.

Another difficulty to be anticipated on this Swedish journey. The reindeer, tractable at all times and easily managed by their Lapland keepers, may in some gale of wind prove untractable, and it is possible the whole may become separated, or they may drift away on the broken fields of ice. Such a loss is hardly to be endured. In that case two boats will be discarded as incumbrances no longer of service, and their fortune will be staked on the remaining and smallest of the three. The deer, we learned, were suffering from the journey, and two out of the herd had already died.

Should the deer fail them they will have recourse to the ordinary food of Arctic travellers, that "pemmican" we have heard of so often and so few of us have tasted.

If the exploring party of twelve is forced to depend upon this little boat of some sixteen feet it will cause much discomfort to the explorers; but even this "detail" has been carefully studied, and we saw the dog-skin mantle which is to serve as their sleeping coverlid if it should come to this. Dog-skin is found far warmer

and lighter than any other known variety of fur in use. The Russians know how to appreciate its heat-retaining qualities, and even the Esquimaux prize it at its true value; but with us almost any other fur is sought for with greater zest, perhaps the attraction being rather in the finer texture and more attractive appearance of various skins in use. Professor Nordenskiold expects to meet with land in the north. This land, if found, will be a source of danger in the opinion of some of his party, as a gale off the land, should it happen, will cause the trouble they almost anticipate. We heard further particulars respecting the mode of compassing their object, which to us appeared of the greatest possible interest. Thus, the food rations consisted of three pounds weight per day for each man, and their reindeer will be added to this supply, as we have stated. Necessaries, clothing, and other baggage would weigh 4050 lbs. It is calculated that each man can drag 425 lbs. over the ice; and we heard of bread, coffee, lime juice, concentrated rum, a cooking apparatus, supplied with petroleum, besides guns, ammunition, axes, spades, saw for cutting ice, and for building snow huts, blanket sleeping bags, India rubber mattresses, and the dog-skin coverlid.

We thought of the wonderful exploits of the dogs we had often heard and read about, and we spoke of

the Russian and Esquimaux sledge journeys performed by these sagacious friends of man; and we spoke to the Professor of 600 miles' journey out and the 600 miles home again before he could accomplish the intended journey; we spoke of the Esquimaux driving six dogs thirty miles a-day with a party of eight in a sledge, and of a smaller number doing their sixty miles; we talked of the story of a Cossack, Alexander Markoff, who was sent from Yaktush to explore the frozen ocean in the summer of the year 1714, by order of the Russian Government, but the sea was so crowded with ice he was unable to make any progress. In this dilemma he formed the design of travelling in sledges during the winter or spring of the year over the ice, which then might fairly be expected to be firm and compact. Accordingly he formed a party for the purpose, preparing several of the country sledges, drawn by dogs, and, accompanied by eight persons, he set out on the 16th of March from the mouth of the Lena, lat. 70° 30′, long. 138°. He proceeded for seven days northward as fast as his dogs could draw, which, under favourable circumstances, is eighty or a hundred versts each day (a verst is about 3500 English feet), therefore the average is ninety versts per day, equal to sixty-two miles, amounting to 434 miles in seven days. Markoff continued his journey until

PARTING WITH NORDENSKIOLD.

Page 326.

his progress was impeded about lat. 78° by the ice being elevated into prodigious mountains. This formation was most probably caused by the proximity of land. Here his journey was arrested, and his provisions falling short, his difficulties were greatly increased. However, some of his dogs having died from want, they became food for those remaining. On the 3rd of April following he arrived at the point from whence he had set out, after an absence of twenty-four days.

It was to no purpose we mentioned these facts to Professor Nordenskiold; he was prejudiced evidently against the use of dogs; and our other arguments respecting the wonderful inventions of modern days, which place us in a far better condition of economising space in a way utterly unknown some few years ago, were to him of no account. The clumsy appliances with which Markoff was forced to be content, weighed more than double, and offered less than half the necessaries, not to mention comforts, we could pack away for such a journey at the present day.

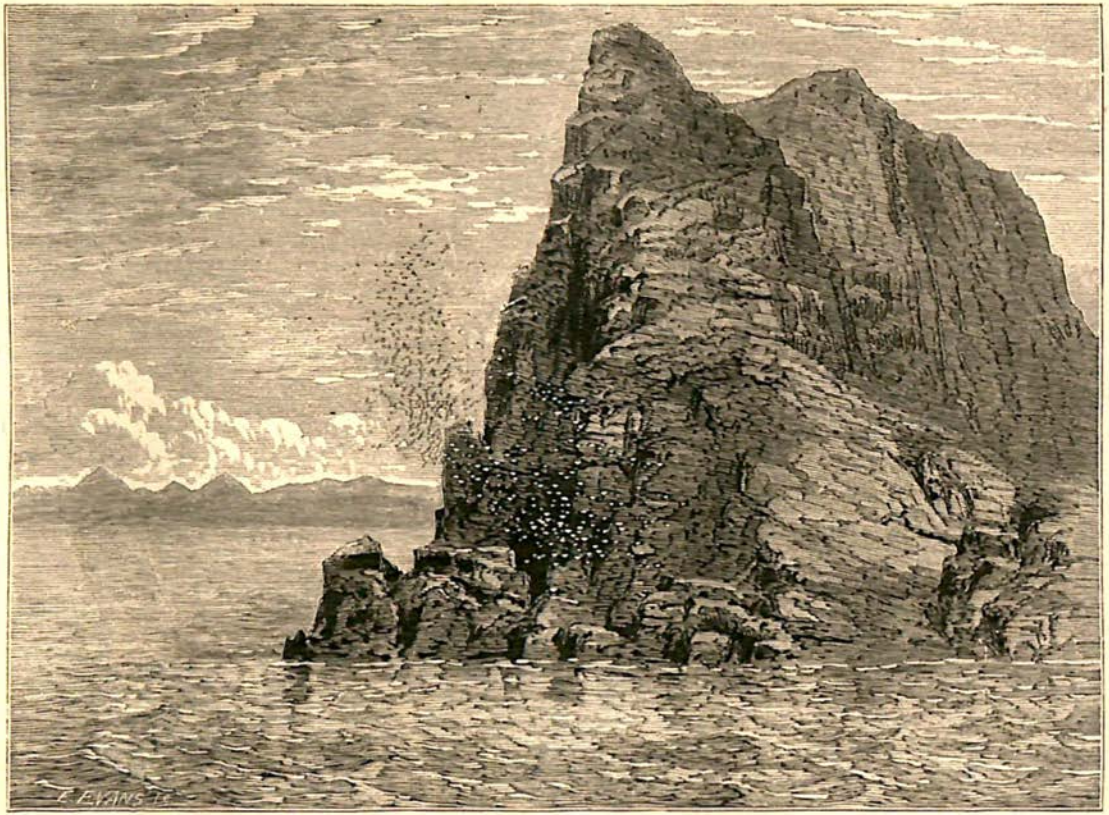
At this time our consultations were frequent and earnest as to the course we should adopt. The all-absorbing question was, whether we should linger for some days longer on the coast, exploring the many bays and fiords, in quest of such sport as should

present itself, and in collecting fresh stores of facts, such as we might find worthy of record, or to turn towards the south, and run for Norway, to visit the numerous ports of call along her coast, as we made for home. One weighty influence was ever present with us—the state of the weather, which, for some days, had been undergoing a frequent and steady change. The cold was setting in with unusual severity; the southerly wind was driving the ice nearer and nearer into the shallow bays, where the blocks were rapidly being cemented together by the formation of bay ice at their base; corners where, in ordinary years, the water would have remained open and free from drift ice, were now choked altogether. To such a cause may be attributed the general condition of the season in these remote regions in certain years; and, as an instance of its effects, the greater degree of warmth in some summers in Iceland, when contrasted with others, may fairly be traced to the influence of a strong and prevailing southerly wind; naturally the corresponding increase of cold on the west coast of Spitzbergen would follow, and the interior would equally suffer from the cold blasts of air carried over the land from the frozen fiords. Subsequent events have proved that our opinion was well founded. This year the winter in northern Europe has been unusually mild, while the

severe cold and protracted winter in America has testified to the correctness of our surmise.

It has been noticed also that when the wind in certain years has prevailed in the opposite direction, the results have been fatal to the harvests of the Icelanders. The state of the wind is therefore an object of the greatest solicitude to the inhabitants of that island. We are undecided then as to our next move. To go north has a kind of infatuation for us. We are quite unable to combat this inclination, and we are hardly willing to leave a coast so full of pleasurable recollections, though we cannot shut our eyes to the fact that the risk of being caught and sealed up in some little out-of-the-way inlet by the formation of some strong barrier of ice in our rear, may happen at this season when we least expect it, so sudden is the change of temperature. While we are deliberating, therefore, on what is best to be done, a rapid and quite unlooked-for change in the wind sets all our doubts at rest. A north wind gently fills our sails, and in the direction of home. At once our meditated plans are thrown aside, and the ship's head is turned once again towards the south and England. At first the flutter of the breeze is hardly perceptible; then its gentle influence is more clearly felt as the sails fill, and the schooner begins to feel its pressure; soon the

welcome wind swells into a lusty gale, and we skim along at a pace that is something to feel, our keel ploughs through the surging waves, and the sea grows heavy with tumbling waves. Fast as we go the hoarse wind drives the rushing water to madness, and we fly before the wild confusion that hurries up from the north. About our bows, the white crests of foam leap up like hounds at the throat of a hard pressed deer. At our stern the great billows tumble in their haste to engulf us, in their frenzied desire to swamp us altogether. Higher and higher the wild waves rise around us—the schooner is built for such a struggle. Her great breadth of beam abaft helps her to rise to the sea, and she spins along with the ease of a floating sea-bird; such a wind is the delight of the seaman, secure in the staunchness of his ship. He watches every motion of his craft as she glides through the troubled waters. No sea-sickness now interferes with the true enjoyment of the crew: they have long since forgotten the experience they had of the rough seas to the north of Lerwick on our outward course, and they go about their various occupations with unmistakable enjoyment. On the 21st September we sighted the Shetlands once more; for three days we had been unable to take the necessary sights for finding our position, and we were



PRINCE CHARLES' FORELAND. *Page* 331.

naturally not quite certain of our whereabouts; but our distance run was carefully taken, and, true to our reckoning, we sighted the land a little to windward. We could now watch the terrible sea driving with stupendous force against the rocks, and we haul to the wind confident in the prowess of our little schooner. She is one of the best sea boats we have ever sailed in. There are few vessels afloat that would venture to weather that storm-tossed shore under the circumstances—a lee shore, a sea running, and a whole gale blowing at the time. It was an awfully grand spectacle, and we were right glad when every difficulty of approaching the harbour was at length overcome, and we once more dropped anchor in Lerwick Harbour. There, that portion of the crew whose services we had secured from the Shetlands left us, and we watched, with profound interest, the hearty welcome, if the term can convey with it the meaning it ought to serve, of their glad wives and children at the return of the long absent relatives to their homes. On Monday we again put out into the gale, which had abated nothing of its fury during our short pause, and once more under its driving influence we sped along the pitching sea. Here it was we fell in with many vessels all hove to, none daring to run with us. We see the great advantage of the broad stern of the

schooner over the narrow and finer lines of the other craft about us. We now resolve to run for Peterhead; but the bar harbour, dry at low water, is surmounted by a boiling and seething surf; no vessel durst venture there in weather such as this, and this, be it remembered, is the condition of the harbours along our eastern coast from Leith to the Humber, offering no refuge whatever for a belaboured craft like ours, running from the north.

Here it was we saw a large water-spout—one of those remarkable phenomena seen at rare intervals along the coast of England; not one of those steady columns of water that rise like a pillar out of calm still water, such as we have seen in the tropical seas—hissing and foaming after the approved fashion, twisting round and round in a long spiral, growing thinner and thinner, until they disappear altogether, to reappear, perhaps, again at a little distance, in company with some ten or twelve other water-spouts, carrying, each of them, an enormous volume of water into the thin, warm air; but this, a great thick cloud, low down over the surface of the sea, dark and threatening-looking, as it travelled, at a great pace, over the waves, and was only linked with the ocean, from which it sprung by a slender neck, as it swept along before the storm, itself threatening, in turn, with destruction

everything that came in its way. To us, this novel form of water-spout was grand in the extreme. That afternoon the elements proved impossible to contend with; we, who had grown accustomed to the gale, by daily contact with its force, were at length compelled reluctantly to give in, beaten in the long struggle. We hove-to in company with some ships bound north possibly, and others, like ourselves, bound towards the south; but these, like ourselves, were unable to endure the force of the tempest. As the wind began to lull, by comparison be it said, we again set out on our course. This time we stood towards Whitby lights, and we caught sight of them just at the proper moment, for we were in ground swell before we got the schooner round. There are few vessels afloat that could weather a point in a gale better or with the ease of our little vessel, and she well maintains her reputation; but this night she has to grapple with the gale, now grown more fierce than ever, and in an evil moment we ship a sea! The water runs well over the taffrail, carrying with it the frail woodwork, and bursting out her sides and gunwale, carrying all before it. Of her two boats, one was soon washed away, the other was shivered to pieces. The galley shifted with the shock was slewed round, and so overturned, that evidently there can be no cooking there to-morrow, to

the great consternation of our cook. This commotion is too much; so there is nothing for us now but to heave to, and put the ship to rights. Once again she rides upon the waves like a duck, and the angry sea roaring in the gale throws its spray in violent wrath against the little vessel; but she has recovered her self-possession wonderfully, and as she rises to the waves once more, shivering no doubt from stem to stern, as she comes up out of the trough of the sea, her little bows seem to the hardy sailors to swell with proud and defiant indignation, as she mounts over the angry waters. Well done! they cry, in exultant tones, as they watch every movement of the craft, now once more plunging madly forward. Not a drop of water comes on board, as she floats supremely over the overwhelming masses of water surging heavily around us. In the far distance we see a goodly number of ships anchored under the lee of the land, and the Humber is well lined with weather-bound vessels, as we beat up the harbour in the afternoon; well pleased, indeed, are we to escape at last out of the turmoil of the sea, where we have been so long contending.

We now sail along with a garland hanging from the mast-head, worn in true old whaler fashion.

Now a bag is produced on board, into which we drop our sixpences for the boys of the relations of our

crew; this is another old custom which has long since fallen into ill-merited neglect; but we were careful to observe all the conditions of the ancient ceremonies, and great was the excitement on board when the moment came for the youths to contend for the possession of our garland. This was a tastefully constructed wreath of gay-coloured ribands, binding a splendid pair of reindeer antlers they had carried home for the occasion. At a given signal the lads rushed into the rigging, and strove, with might and main, to reach the prize, which hung suspended from the mast-head. At first the contention was general; presently the object of all seemed to be to prevent, if possible, the likely hands from clutching the garland, now that the others could no longer hope to win it for themselves. Then the fun grew fast and furious, and we watched, with the keenest interest, as the contest waged aloft came to a speedy termination by the winner at last securing the gaudy badge. As the struggle came to a close, we found ourselves close by the landing-place. where a crowd of lads had already assembled to welcome our return; and the fine old sea-port town sent down its quota of inhabitants to give us a hearty greeting. In a few minutes more we were made securely fast to a little steam tug-boat, under whose guidance we found our dock, where but little time was

lost in stripping our schooner of all her gay attire, and she was left secure, resting for a season until another spring would find her ready for an enterprise we hope will be as successful and inspiriting as our own had been. With the schooner will go our most hearty good wishes, and that her next venture be as prosperous as ours had been, is our unfeigned wish.

The total number of animals taken during the voyage was two hundred and thirty-seven seals, two whales, two narwhal, two bears, and thirty-three reindeer, besides a large number of smaller game, birds, &c.

Surely it only requires a personal acquaintance with the trifling difficulties presented by the navigation of these Spitzbergen seas to satisfy any unprejudiced person respecting the superiority of this route over any other known Arctic highway. To gain the northern shore of Spitzbergen is a matter of easy attainment in most years, as may be proved by the regular appearance there, year after year, of a few poorly equipped fishing vessels, built of ordinary pine wood and of small tonnage, in no way specially fitted for contending with the ice. There is no kind of inducement to the captains of these little vessels to go beyond the shores and bays of Spitzbergen, and it is therefore not to be wondered

at that they should return home year after year from high latitudes without adding any new facts to our knowledge of Arctic geography. To the class of men we met with on the coast, a single hour devoted to scientific research would be simply loss of precious time; and as the day arrives when they find it expedient to put their ships about for home, they go south again utterly indifferent to the interest that attaches at the present time to the question of circumpolar exploration, in spite of the admirable efforts of M. Mohn, of meteorological celebrity. It may be that in severe seasons these whalers have difficulties to contend with, and we do not seek to conceal the fact that there are difficulties of no ordinary kind, or no small degree, to be encountered; but contrasting the very worst misadventures to which their boats are liable to be exposed in some exceptional years, we say that they are nothing when compared with any ordinary voyage to or returning from Smith's Sound. Are not the Arctic books, written by McClintock and others, full of records of heroic endurance and privations? whose very recital fills the mind with admiration for the men who have borne the toil, while our heart recoils from willingly consenting again, for all the scientific gain that is to accrue to the student at home, that men should go on any expedition that

way, which has so often ended in delusion and positive disaster. Have we not the books of Kane and Hayes to confirm all that has been said and concealed by our own hardy explorers? and besides, have we not seen men set out for the Arctic regions who, utterly ignorant of the peculiar nature of the navigation of these seas, have blundered sadly in spite of the proffered assistance of experienced whaling captains? What can be more depressing to a navy man, than to hear constantly of the errors now become traditional of these worthy fellows who bravely toiled through Baffin's or Melville Bay—traditions ludicrous in details that will insure their preservation for years to come, amongst the whaling community? And it is this Smith Sound route which still preserves its sway amongst the older men of our navy; not, indeed, because they are convinced of its practicability by their own personal experience, for this can hardly be the case, if we read the Parliamentary reports on the various journeys made in search of Sir John Franklin and his party, but for some occult reason never fairly given. It cannot be because there is less danger to be met with by this route, as we have endeavoured to prove. It cannot be on the score of expense, for once admit the Smith Sound route to be the favourite of the public, who are now thoroughly roused to the question of

the importance of Arctic enterprise, and there is no knowing where the waste of public money will end. The country has hardly recovered from the impression made upon the exchequer for defraying the former Arctic explorations, and that department of the State will care little to enter again on a like career of lavish expenditure.

On the other hand, the Spitzbergen route, having numerous places of call for refreshment and assistance, whenever refreshment and assistance may be required, is a most inexpensive one; the cost of the ship is the main item; this outlay can always be regained by her ready sale when done with for this particular purpose of scientific investigation; the expense of the men and officers for the voyage, at so much a month, is easily calculated, and cannot much swell the bill. The outfit is not a heavy item, and the necessity of supplies in case of a mishap which would involve a winter on the Islands (always to be taken into consideration and to be duly provided for), is but an item of expense which is after all a contingency. It cannot be used as an argument for the use of the Smith Sound route that more facts in scientific inquiry can be gleaned along the northern shores of Greenland; for, all the scientific men we have consulted have declared that the north shores of

Spitzbergen are of identical value, for either local observations or as a base of operations, having the same investigations in view.

It cannot be that the shores of North Greenland, once gained, would be safer for the parties engaged in subsequent observations, for the coast is peculiarly liable to the dangers arising from drift ice and icebergs, so that months may elapse before assistance could reach the explorers, or that they themselves could escape. A glance at the rugged nature of the packed ice will convince the most incredulous, of the utter impossibility of men on foot, or of sledge parties, aided with dogs, being able to make any real progress over the surface there.

At Spitzbergen, on the other hand, the ice is almost smooth—at all events its surface is only rendered uneven by the scattered ice upon it, and the accumulation of snow which drifts by the force of the wind into little heaps over these trifling objects—there is no iceberg in these seas to render by its advent or departure additional solicitude to the traveller. Parry, in July of 1827, it may be remembered, was so heavily encumbered by boats unsuited for the purpose there is no longer any reason to wonder at his failure in getting further than the highest Arctic latitude yet attained; but the wonder is rather that he got so far

with the clumsy appliances at his command. Compare his two boats with Nordenskiold's three already mentioned. We ourselves had, it may be recollected, on some occasions to drag our boat, laden with her ordinary sporting and fishing gear, for trifling distances over the ice in our pursuit of game, and we had ample opportunity of gathering from our experience some slight notion of the great explorer's difficulty; but, with the aid of steam, Parry (there can now be no doubt on the matter) would that year have gained the object of his voyage, just as we ourselves might have reasonably hoped to do in our schooner; for the great surface of ice when it begins to experience the action of the warm current of water, and the great heat of the summer sun, soon breaks up, and the riven mass leaves long channels between the floating masses, and by these openings, a steamer properly handled might easily sail into the open water beyond. The ice is easily managed by the expert whalers, and no peculiarity in an Arctic voyage is more startling to the inexperienced naval officer than the ease with which the harpooners deal with what, to such a one, would seem crushing difficulties. Experienced whalers are able to live, and live comfortably, in places where the mere man-of-war's man would assuredly starve. The cunning animals of the North

seem to be endowed with higher qualities of head and heart than animals enjoying a more temperate zone. On the one hand the less gifted are able to escape from their more powerful and more highly organized enemies; and on the other, they demand all the skill the hunter can master in his hunting craft in order to effect their capture. It is stated that the Eskimo found money in plenty, weapons of precision, and suitable ammunition in abundance, lying near the remains of Franklin and his party; but the few feathers that lay scattered about proved to these keen-witted folk that the men must have failed altogether in procuring food for themselves. A fowling-piece in the hands of a blue-jacket is as absurd an anomaly as a sewing-machine would be, and armed with such a weapon he is at all times more liable to do himself or others an injury, than to bring down any food for his party. Nor are the authorities justified in believing that private enterprise is incapable of obtaining valuable results in Arctic exploration. We have the records of all that has been done, and we are convinced that but for the results of private enterprise our Arctic attempts would be the laughing-stock of Europe. To lay out public money, to fritter it away in hopeless waste, has ever been the tendency of scientific enterprise at the expense of the Government.

Who has not looked on with pain akin to shame, at the reckless waste of time and money on so-called scientific expeditions? We trust a change has now come over the feelings of scientific men, and that they feel greater responsibility attaches to the important offices they fill, and that we shall hear no more of such things; but we maintain that private enterprise can and always will produce equal, if not greater, benefits to science than enterprise carried out by Government.

It had been stated that so satisfied were the advocates of the Spitzbergen route on the continent of Europe, of this their favourite project being likely to prove unproductive, that the Swedes and Germans in particular had abandoned their hobby, and that therefore the Smith Sound people were entitled to their fair share of praise for so constantly adhering to their pet scheme; but at the very time this statement was being made in London, Nordenskiold was intently busy upon his project, and night and day he was devoting himself to the task of collecting the money requisite for the venture, and in directing the minutest details for the successful carrying out of the expedition he is now entered upon. Again, if the Smith Sound project is carried out—if, after encountering all the difficulties of approach to the point where the Americans left off defeated; if after they have passed

far out of the range of reasonable hope that assistance can reach them in case of difficulty (for once the little Danish settlements on the Greenland coast are left, they bid farewell to their last place of call); and if, perhaps, they arrive at the barrier of frozen ice which rises like a wall at the narrow neck of the inlet from the Arctic ocean, they must leave their ships and proceed over the rugged summit of the ice barrier for a distance of some twenty-five miles, to come out, where? On the coast of the sea they would fain embark upon, far from their supplies, and out of reach of help of every kind, to begin to encounter those difficulties which surely must exist, but of whose nature or importance they are by the circumstances of the case utterly ignorant, to latitudes, the Eskimo tell us, where it is impossible to live.

It must not be supposed that the contributions of various travellers to the easily attained lands of Spitzbergen and its neighbourhood, have by any means exhausted the whole of the Spitzbergen region. So far is this from being the case, we have plenty of evidence to prove that for many a year Spitzbergen will itself afford materials for careful investigation in every department of human inquiry. We have evidence, from specimens torn off the rocks near the various landing-places, of a physical condition of that portion

of the globe in very remote times which would warrant us in concluding that Spitzbergen had its human inhabitants indigenous to the soil, or wanderers from other regions, and it will be curious if in future explorations human remains and implements made by human hands will reward the search of ethnologists. As yet we believe no such discoveries have been made, simply because they have not been attempted. Only this year news has come of the discovery, or rather confirmation, of the actual position of land to the eastward of Spitzbergen, which hitherto has only been indicated on our charts from the vague and by no means accurate reports of such explorers as Altmann. Skipper Nils Jonson, of Tromsö, actually landed on this portion of the earth's crust, having sailed on the 8th of May last from his native port to Novaya Zemba, in pursuit of oil-bearing animals. His vessel was a little yacht called the *Lydiana*, of thirteen commercial lasts (a little over thirty tons), having on board a crew of nine men.

In June he turned his ship's head towards the west side of the great sea, and towards the end of the month, in a south-easterly direction from Spitzbergen, in the midst of the Polar stream which brought with it an immense mass of ice, towards the east side of Spitzbergen and Behring's Land. In July and August

the ice stream turned more to the East, towards Novaya Zemba, and left their "Farande" (distant water free from ice). During July and August Jonson was busy with his trade on the banks of Spitzbergen, and by the 16th of the latter month he had resolved to go on a voyage of discovery. Arriving at lat. 78° 18′ 46″ N. and 30° long., he caught sight of land, which for the first time in the year 1617 found a place on our maps under the name of Micha Land. The water along the south and east coast of the land was altogether free from ice, and the following morning he landed, in order to ascend to the summit of a neighbouring mountain, and from this elevation to make a survey of the scene. It was his intention also to go in search of whatever game the land might possess, and to examine what supplies of drift lumber the coast could offer. He soon satisfied himself that Altmann's report of the existence of three separate islands was wrong. Probably the error arose from the survey having been made from the deck of his ship. On the contrary, from this elevated point of view, the land presented the appearance of a vast continent, covered at intervals with high mountain lands, and these united by lower lands, whilst the coast was rocky and abrupt.

The skipper naturally expected to find the interior

laden with the same glaciers and snow fields that encumber Spitzbergen. Judge then of his surprise to find but one small glacier towards the south, while the mountain sides exhibited the colours of the rock of which they were composed, and several large tracts of water spread out over the surface of the land reflected in their placid bosoms the bright sky above. The shore was completely covered with an immeasurable mass of driftwood, which extended as far as one hundred feet from the vessel, and was heaped up to a height of twenty feet above the level of the water. The length of this land was estimated at forty-four sea miles (240 English miles). The mountain where these observations were made, proved to be in lat. 79° 8′, long. 30° 15′. The fauna met with included the ordinary Arctic species. Seals in abundance sported in the sea, herds of reindeer grazed along the sides of the mountains, and in the pastures which made the valleys green. Jonson and his men had never seen fatter or larger deer. Some of these animals were killed, and their great accumulation of fat appeared to them of such interest that means of preserving specimens for the museum at home were successfully taken; these, together with portions of the rocks and fine specimens of fossil plants, were also procured for the same institution, as well as some for

the purposes of identification, which are now in the hands of Oswald Heer, of Zurich, the famous botanical palæontologist. On the 17th of August the party embarked, and for two whole days they sailed along the coast, and met with no obstacle from ice or other impediment.

Is it then likely that there remains nothing more for the explorer in these regions to reward him for his inquiry? Surely we have in this account fresh evidence, if such were wanting, that the northern seas deserve attention. These seas are not so devoid of interest as the shrewd practical man might at first suppose. The presence of rare and profitable resources to be derived from the enormous abundance of animal life in the Arctic circle is a temptation which alone would justify further exploration. The trifling risk attending the present clumsy appliances of the whaler can be made less by a more intimate knowledge of the currents, and the causes that influence them in these high latitudes ought surely to induce the philanthropist to assist in their solution. The existence of animal life in such abundance warrants us in believing that man may live in some remote Arctic lands of whose existence we are still ignorant, and if in the course of time human beings have disappeared from these scenes of their former occupancy, it will

be of interest to all to learn from their remains how far they had gone along the road of human progress. The enormous deposits of wood accumulated upon the shores of Arctic lands have their evidence to render, which is of especial service to the students of nature; the direction of the streams is surely indicated by the species they represent; and the easterly coasts of all islands in certain directions being more encumbered by ice than the corresponding western shores of all those known, point to one description of facts, not without their meaning, which tell only a portion of the truth they reveal, so long as we are restricted in our knowledge of the whole of the Arctic cosmography.

In the Spitzbergen seas we have passed to the eastward of the great iceberg system, since icebergs would be found drifting from the eastward if they were generated anywhere in that direction. There are therefore no ice-bound coasts to be encountered in this direction, no floating barriers exist whose frozen walls offer no portal for the Polar explorer. The flat ice that is found floating on the seas will surely admit of the steam ship, easily handled in the various narrow channels, as it breaks up for the year; and modern appliances can easily be brought into requisition now, whose enormous power was not understood during

the long interval in which, owing to the causes which interfered with all the later Arctic expeditions, the question of Polar exploration has languished. Science has made enormous strides during this interval, and the food, clothing, ship's outfit and equipment, not to speak of the minor but still vastly important contributions to the comfort and even enjoyment of any similar enterprise to be entered upon at the present date, deprive Arctic exploration of most, if not all, of its former *désagrémens*.

APPENDIX.

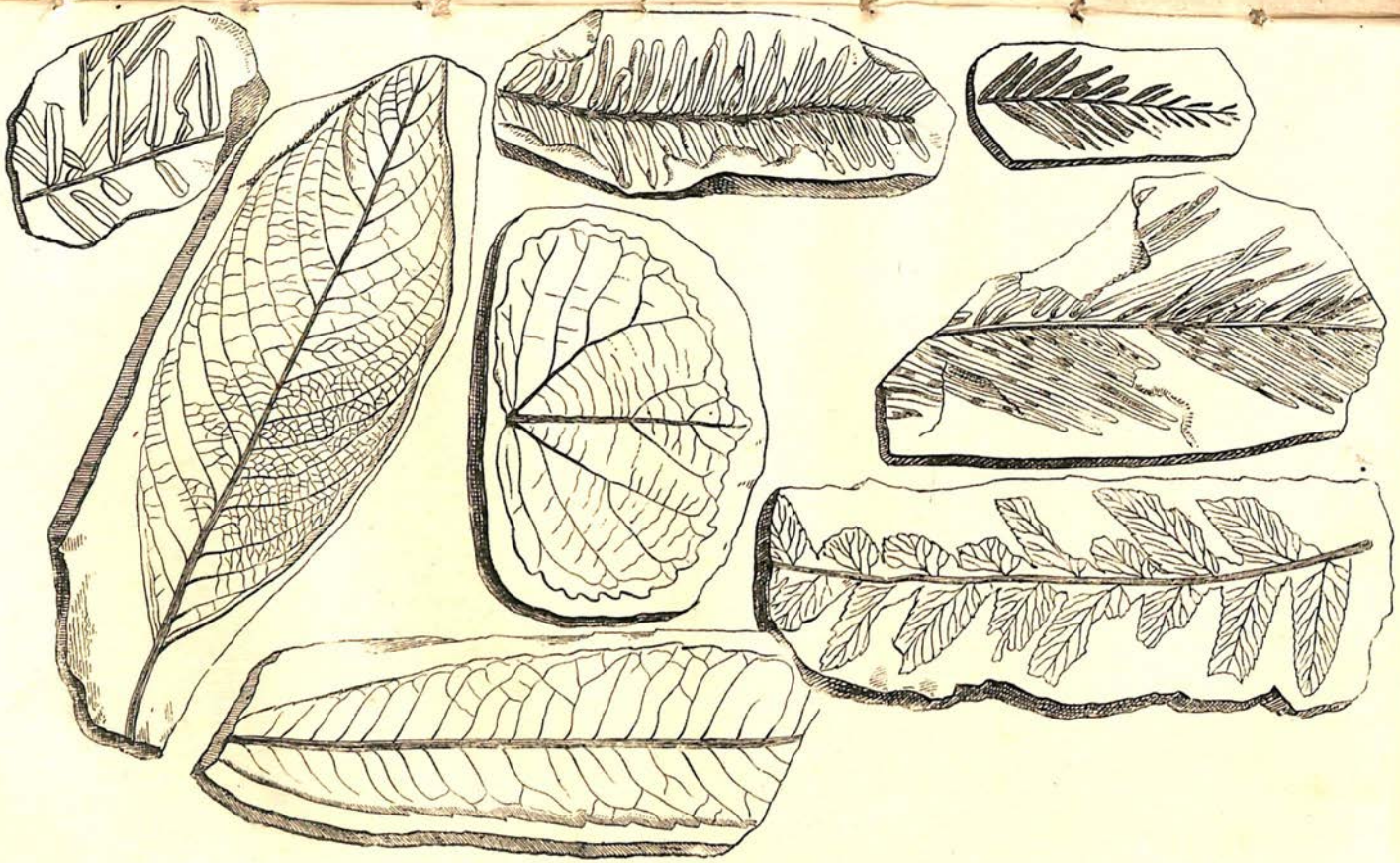
THE fossil plants belonging to the Miocene period of Spitzbergen have been ably treated by the distinguished naturalist, Oswald Heer, in the "Kongliga Svenska Vetenskaps Academiens Handlingar" for 1869. The results fully prove that a warmer climate existed in Spitzbergen when these plants flourished. In his list of the Miocene flora he identifies three species of the family of Fungi.

1	in that of the	Sea-weeds.
1	„	Mosses.
2	„	Ferns.
1	„	Equisetæ.
5	„	Cypress.
17	„	Poplar.
3	„	Taxineæ.
1	„	Ephedrineæ.
14	„	Grasses.
10	„	Cyperaceæ.
1	„	Rushes.
2	„	Aroideæ.
1	„	Typhaceæ.
2	„	Alismaceæ.
2	„	Irideæ.
4	„	Salicineæ.
3	„	Betulaceæ.
5	„	Cupuliferæ.
1	„	Plataneæ.

1	in that of	the Polygoneæ.
1	„	Chenopodiaceæ.
1	„	Elæagneæ.
2	„	Lynantheræ.
1	„	Ericaceæ.
1	„	Oleaceæ.
2	„	Caprifoliaceæ.
8	„	Araliaceæ.
2	„	Ranunculaceæ.
2	„	Nymphæaceæ.
2	„	Tiliaceæ.
2	„	Rhamneæ.
1	„	Juglandeæ.
2	„	Pomaceæ.
1	„	Rosaceæ.
1	„	Amygdaleæ.
1	„	Leguminosæ.
21	„	Dubiæ Sedis.

It will be seen by this list of easily identified species, that the plants of a temperate region once existed there, and individuals of the same species are found in the districts named below in the following order:—

25	are found	in	Greenland.
8	„	„	Iceland.
5	„	„	on the Mackenzie.
7	„	„	in Alaska.
30	are recognised as belonging		to the Arctic Flora.
10	„	„	„ to the Baltic Flora.
5	„	„	„ „ Schosonetz.
2	„	„	„ „ Bonnerkohlen.
8	„	„	„ „ Wetterau.
8	„	„	„ „ Bilin.
11	„	„	„ „ Switzerland.
5	„	„	„ „ France.
8	„	„	„ „ Italy.
2	„	„	„ „ Kumi (Greece).



SOME OF THE FOSSIL LEAVES WE FOUND IN SPITZBERGEN.

Page 352.

The insect fossil fauna is represented by twenty-three species.

Of the nine families of the Coleoptera the list contains :—

2 Carabus.
1 Dytiscidæ.
1 Sylphidæ.
1 Hydrophilidæ.
2 Elateridæ.
1 Serropalpæ.
2 Donacidæ.
2 Chrysomelidæ.
4 Curculionidæ.

Of the Orthoptera, *Blatta hyperborea* is the sole representative.

Of the Hymenoptera there are two species.

Of the Marine fauna in the Miocene period we have :—

1. Terebratula grandis.
2. Dentalium incrassatum.
3. Dentalium spec.
4. Pecten spec.
5. Corbula Henkelinsi.
6. Corbula spec.
7. Ostrea spec.
8. Perna spec.
9. Turbo sp. ?
10. Buccinum sp.
11. Natica Phasianella.

Of the Bryozoa, a new species, *Lunulites*, has been added to the list of this interesting and little understood group.

The list of existing plants found in Spitzbergen at present is a short one: amongst them will be found:—

Taraxacum officinale.
Ranunculus, (1) sulphureus, (2) pygmæus, and (3) hyperboreus.
Papaver nudicaule.
Cardamine pratensis.
Arabis alpina.
Draba alpina, leptopetala, corymbosa.
Cochlearia fenestrata.
Silene acaulis.
Cerastium alpinum.
Sagina nivalis.
Saxifraga nivalis, and 6 others.
Chrysosplenium tetrandrum.
Rhodiola rosea.
Rhododendron lapponicum.
Polygonum viviparum.
Oxyria digyna.
Salix polaris and herbacea.
Juncus biglumis.
Luzula arcuata.
Festuca rubra.
Poa cenisia.
Catabrosa algida.
Glyceria vilfoidea.
Aira alpina.
Calamagrostis neglecta, and
Equisetum arvense.

Of the Birds seen we observed specimens of—

Tringa maritima.
Larus glaucus.
Lestris parasitica.
Procellaria glacialis.
Mergulus alba.
Uria Brunnichii and Grylle.
Fuligula spectabilis and mollissima.

There are no Coleoptera in Spitzbergen, while twenty-one specimens are recorded as found in Greenland.

Of Hymenoptera there are thirteen, and only three have been noticed in Greenland. Then in the latter country, Lepidoptera are abundant, twenty-six being described, while but one specimen has as yet rewarded the student whose investigations have led him to the far north. Of the Diptera, however, there are forty-nine in Spitzbergen, and further west only twenty-six. And no Hemiptera as against four Greenland species.

THE END.

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